ACTEON 2010
pH-Temperature
User manual

WRITTEN BY	REVIEWED BY	APPROVED BY
NAME: STÉPHANE LE GUYADER	NAME: PIERRE PECCHIA	NAME: YVAN BOUDEY
SIGNATURE:	SIGNATURE:	SIGNATURE:

IMPORTANT

Read the manual carefully before switching the device on.

So as to maintain and ensure the good working order of the device, the user must abide by the safety precautions and warnings featured in this manual.

Assembly and activation:

- Assembly, electrical connection, activation, operation and maintenance of the measuring system must only be carried out by specialist personnel authorised by the user of the facilities.

- The specialist personnel must be familiar with this activation manual and are to follow its instructions.

- Before carrying out connection, make sure that the power supply is compliant with the directions mentioned on the nameplate.

- A clearly signposted current switch must be installed nearby the device.

- Before turning the system on, check all the connections.

- Do not activate damaged devices; they represent a hazard and should be labelled as faulty.

- Repairs must only be carried out by the manufacturer or by a Ponsel after-sales-service.

CONTENTS

1 THE MEASURING SYSTEM 6
1.1 The basic system 6
1.1.1 A pH and temperature transmitter 6
1.1.2 A pH sensor 6
1.1.3 A temperature sensor 6
1.2 Accessories 7
1.2.1 Consumables 7
1.2.2 Accessories for a tank-mounted installation without cleaning system 7
1.2.3 Accessories for a tank-mounted system with a pH sensor cleaning system 7
1.2.4 Accessories for the pH filling sensor (**PONCPC-PHL-RV-10)** 7
1.2.5 Accessories for an installation mounted inside pipes for pH (**PONCPC-PHL-10**) and Temperature sensors 8

2 INSTALLATION 9
2.1 Mounting the ACTEON 2000 transmitter box 9
2.2 Connection of the ACTEON 2010 transmitter to the pH and Temperature sensors 9
2.2.1 Acteon 2010 wiring 10
2.3 Tank-mounting 10
2.3.1 Using the stand and protective hood 10
2.3.2 Installation of a sensor with a (elbowed or straight) sensor-holder perch and nozzle (**PONPPCC-PH/EH** or **PONPPCD-PH/EH**) 11
2.3.3 Installation of an ESHP (Elbowed Sensor-Holder Perch) or SSHP (Straight Sensor-Holder Perch) on a QRPM (Quick Release Perch Mount) (PONSPFR and PONSPFR2) 13
2.3.4 Installation of a pH sensor cleaning system 14
2.4 Installation mounted inside pipes: 15

3 THE ACTEON 2010 TRANSMITTER 16
3.1 Control console 16

4 SUMMARY OF ACTEON 2010 MENUS 17

5 THE MEASURE WINDOW 18

6 CALIBRATING THE ACTEON 2010 19
6.1 Calibrating the sensors 19
6.1.1 Calibrating the pH sensor at two points (complete calibration) 20
6.1.2 Adjusting the slope of the pH sensor 23
6.1.3 Returning to theoretical calibration for measurement of pH 25
6.1.4 Calibrating the temperature sensor at two points (complete calibration) 26
6.1.5 Adjusting the slope of the temperature sensor 29
6.1.6 Returning to theoretical calibration for temperature measurement 31
6.2 Information on error messages during calibration of the pH sensor 32
6.2.1 Error during calibration with the pH 7.01 buffer 32
6.2.2 Error during calibration with the pH 4.01 buffer 32
6.3 Information on error messages during calibration of the temperature sensor 32
6.3.1 Error during calibration at 0°C. 32
6.3.2 Error during calibration with water at ambient temperature 33

7 VIEWING THE MEASUREMENT HISTORY 34

8 VIEWING THE SENSOR CALIBRATION REPORT 35

9 CONFIGURING ACTEON 2000 36
9.1 Configuring the averaging of the sensor response 37
9.2 Configuring the trend curve 38
9.3 Configuring the two 4-20mA outputs 39
9.3.1 Adjusting the stopped thresholds for the 4-20mA outputs 40
9.3.2 Calibrating the 4-20mA outputs 42
9.4 Adjusting the relay outputs 44
9.4.1 Configuring the relays in mode 1 45
9.4.2 Configuring the relays in mode 2: 46
9.5 Adjusting the measure units: 47
9.6 Setting the language: 48
9.7 Returning to the factory default values: 49

10 THE INFO MENU 50

11 ADJUSTING THE CONTRAST OF THE ACTEON 2000 DISPLAY 50

12 TECHNICAL SPECIFICATIONS: 51

13 THE SENSORS 51
13.1 The pH sensor 51
13.1.1 Specifications 51
13.1.2 Description 51
13.1.3 Activation 52
13.1.4 Maintenance 53
13.1.5 Cleaning 53
13.2 The temperature sensor 53

14 QUESTIONS & ANSWERS 54
14.1 pH measurement anomalies 54

15 APPENDIX 55

Figures

Figure 1- Transmitter mounting diagram 9
Figure 2- Installation of a measuring system 9
Figure 3– Installation including a connection box with integrated pre-amplifier 10
Figure 4– Mount and hood for the transmitter 11
Figure 5- Elbowed Sensor-Holder Perch 11
Figure 6– Nozzle for sensor without cleaning system 12
Figure 7– Installation of a perch on a QPRM with one or two sliders 13
Figure 8- Installation of a pH sensor mounted inside a pipe 15
Figure 9- Installation of a temperature sensor mounted inside a pipe 15
Figure 10- Diagram of the pH sensor 52
Figure 11- Wiring diagram for the transmitter terminal 55

1 The measuring system

1.1 The basic system

At a minimum, a measuring system requires the following elements:

1.1.1 A pH and temperature transmitter

PONACTEON2010	ACTEON 2010 transmitter - pH-meter and thermometer

The pH and Temperature transmitter comes complete with a pH 7.01 buffer solution, a pH 4.01 buffer solution, instructions and a CD.

1.1.2 A pH sensor

Two sensors are available depending on use:

PONCPC-PHL-10	Electrolyte plastogel® pH sensor with 10-metre cable and LEMO connector (perch-mounted or mounted inside a pipe)

In cold liquids with very low conductivity (less than 50 µS/cm) or contaminating media, it is recommended to use a filling sensor with bridge.

PONCPC-PHL-RV-10	Glass-bodied pH filling sensor with 10- metre cable and LEMO connector

1.1.3 A temperature sensor

PONCPC-T-10	Temperature sensor with 10-metre cable (perch-mounted or mounted inside a pipe)

1.2 Accessories

1.2.1 Consumables

PONMANU-2010	Additional User Manual
PONKCL-1M	125-ml bottle of (1M) KCl for pH and Eh filling sensors
PONKCL-2M	125-ml bottle of (2M) KCl for pH and Eh filling sensors
PONKCL-3M	125-ml bottle of (3M) KCl for pH and Eh filling sensors
PONPEPNET	125-ml bottle of pepsin cleaning solution for Eh and pH sensors
PONSOLCSV	125-ml bottle of storage solution for pH/Eh sensors
PONPH-AMP-4	125-ml bottle of pH 4 buffer
PONPH-AMP-7	125-ml bottle of pH 7 buffer
PONPH-AMP-10	125-ml bottle of pH 10 buffer

1.2.2 Accessories for a tank-mounted installation without cleaning system

PON-BJAI-E PH/EH/T	**IP 68 leak-tight** connection box (complete with 10 metres of cable) with integrated pre-amplifier, for connecting pH/Eh and Temperature sensors over distances greater than 10 metres (see Figure 3 - Installation including a connection box with an integrated preamplifier)
PONCBMC-9	9-conductor screened cable for linking the connection box to ACTEON 2000
PON-ACT-24V	Optional 24 VDC power supply
PON-PDPCV-1	PVC stand and protective hood for an ACTEON 2000 transmitter
PON-PDPCV-2	PVC stand and protective hood for two ACTEON 2000 transmitters
	PVC protective hood for an ACTEON 2000 transmitter
	PVC protective hood for two ACTEON 2000 transmitters
PONPPCC-PH/EH/T	Elbowed sensor-holder perch (ESHP) for pH/Eh or Temperature sensors. Complete with nozzle and glued coupling
PONPPCD-PH/EH/T	Straight sensor-holder perch (SSHP) for pH/Eh or Temperature sensors. Complete with nozzle and glued coupling
PONBUSE-PH/EH/T	Nozzle for pH/Eh (without cleaning system) or Temperature sensors. Complete with 50 diameter BP3P glued coupling
PONCOUDE	90° elbow for closing off a sensor-holder perch
PONSPFR2C	ESHP or SSHP type mount for 2 perches – 1 arm, 2 sliders – made of stainless steel.
PONSPFR1C	ESHP or SSHP type mount for 1 perch – 1 arm, 1 slider – made of stainless steel
PONSPFR-COUL	Additional slider for a QRPM system (Quick Release Perch Mount)

1.2.3 Accessories for a tank-mounted system with a pH sensor cleaning system

PONCA-HX1	Air compressor in IP65 casing for permanent cleaning, 230 V power supply (to be used with a perch and nozzle for cleaning)
PONPPCC-PH-NET	Elbowed sensor holder perch for pH type sensors. Complete with a nozzle housing the cleaning system and rilsan tube
PONBUSE-PH-NET	pps4 nozzle for pH sensors (with cleaning)
PONTUBE-NET	4 x 6 mm black rilsan tube for cleaning system, 7 metres long complete with connector + 3 metres in the perch

1.2.4 Accessories for the pH filling sensor (**PONCPC-PHL-RV-10)**

PONRAC-PH/EH-RV	Connector for a filling system
PONRES-PH/EH-RV	5-litre capacity electrolyte tank for a filling system
PONROB-PH/EH-RV	Tap for an electrolyte tank for a filling system
PONTUB-PH/EH-RV	10-metre tube for connecting the tank to the strainer, for a filling system
PONCREP-PH/EH-RV	Strainer for a filling system

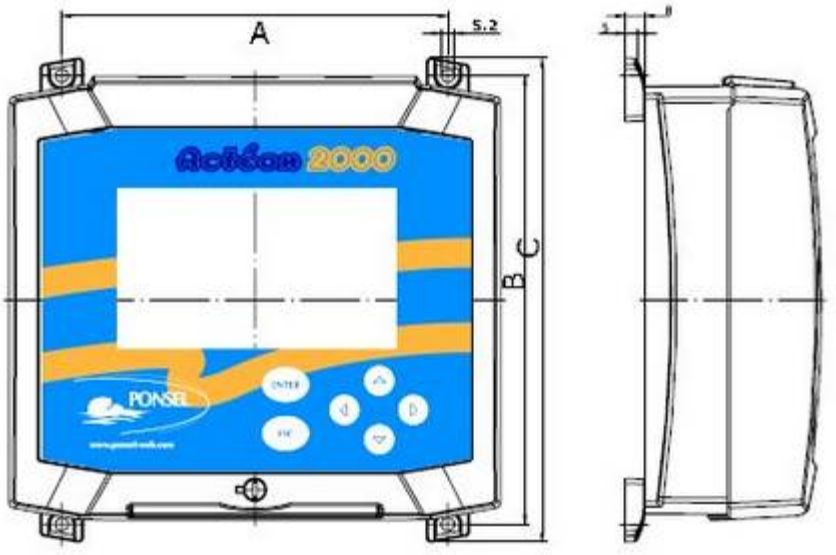
1.2.5 Accessories for an installation mounted inside pipes for pH (**PONCPC-PHL-10**) and Temperature sensors

PON4020	Tee assembly fitted with 20 x 27 male/female sockets for AP1. To be fitted on PVC piping
PON40	40 diameter glued tee assembly (without connectors) for AP1
PONAP1	Adapter sleeve for pH and temperature sensors mounted inside pipes
PONVCPO-63	Stainless steel 63 mm clamp type assembly mounted inside a pipe (316 L) (for MES, OXY, Eh, pH, Temp, C2E and C4E sensors). To be fitted with the appropriate nipple. To be fitted on stainless steel piping
PONNIP-PH/EH	Nipple for pH/Eh sensors
PONNIP-PH/EH-T	Nipple for 2 pH/T or Eh/T or pH/Eh sensors
PONNIP-T	Nipple for Temperature sensor

2 Installation

2.1 Mounting the ACTEON 2000 transmitter box

Acteon 2000 mounting diagram



	A	B	C
Dimensions (mm)	156.5	181	195.3

Figure 1- Transmitter mounting diagram

2.2 Connection of the ACTEON 2010 transmitter to the pH and Temperature sensors

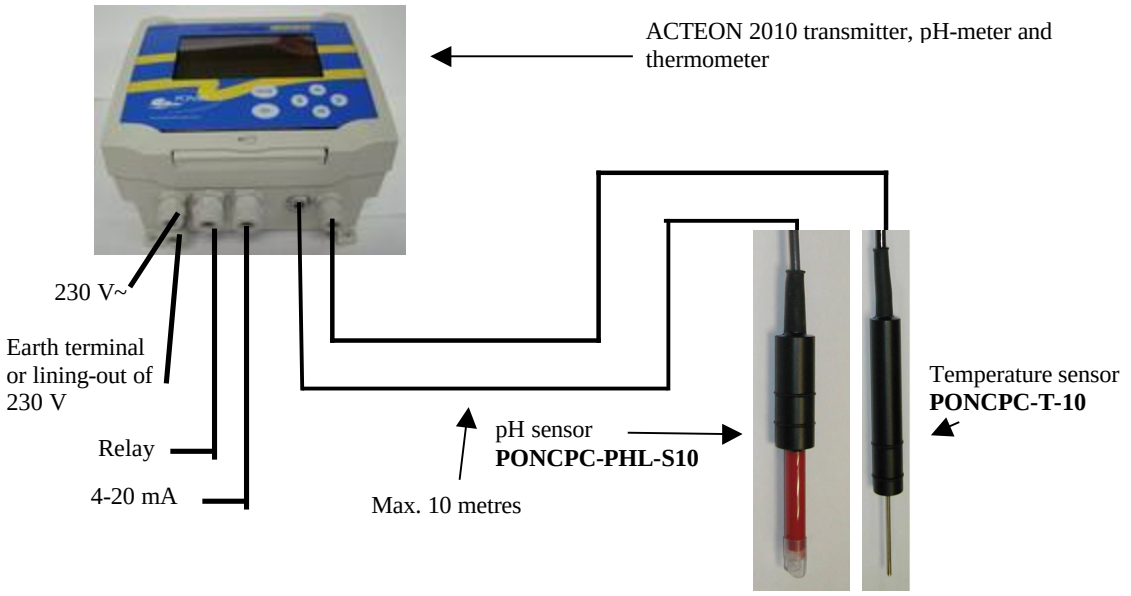


Figure 2- Installation of a measuring system

Comment:
If the connection cable between the pH sensor and transmitter is longer than 10 metres, a **leak-tight IP 68** connection box with integrated pre-amplifier must be used (REF: **PON-BJAI-E PH/EH/°C)**.

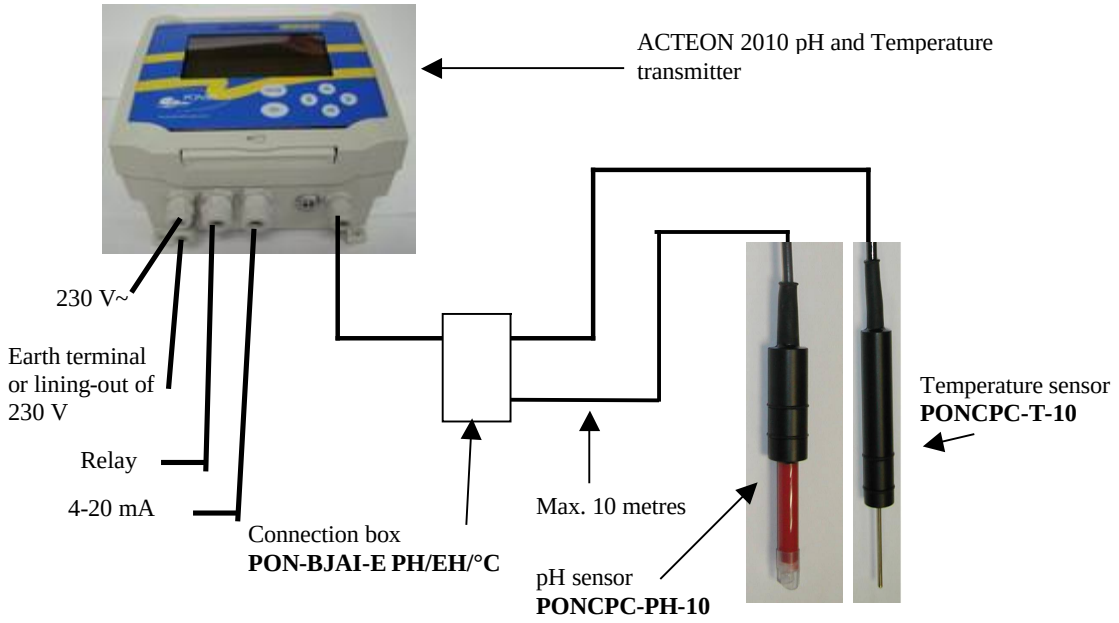


Figure 3– Installation including a connection box with integrated pre-amplifier

2.2.1 Acteon 2010 wiring

See appendix (§15) at the end of the document.

2.3 Tank-mounting

2.3.1 Using the stand and protective hood

A protective hood (**PON-PDPVC-1**) is available for mounting the ACTEON 2000.
The hood is essential in the case of direct exposure to adverse weather or sunshine.

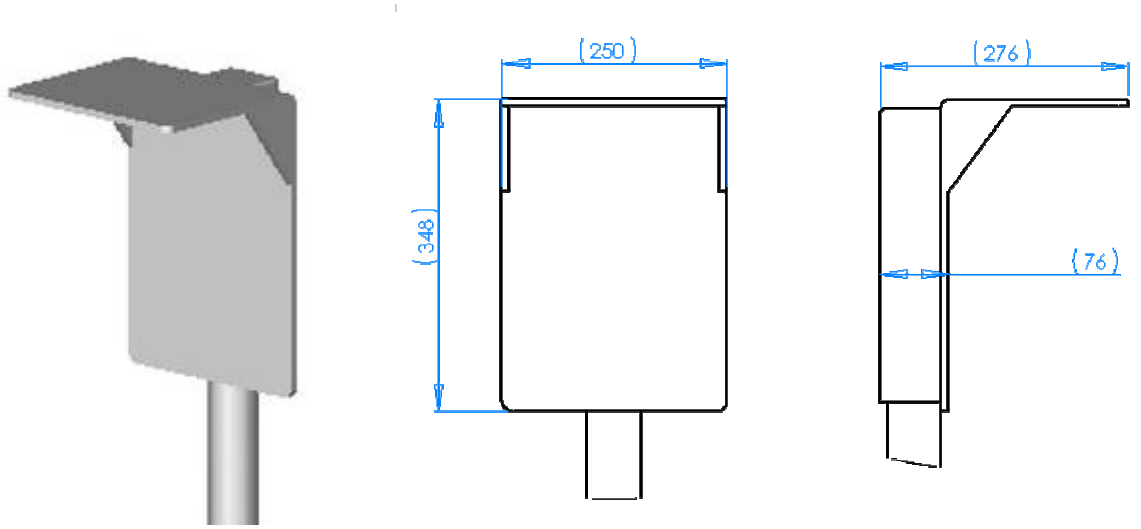


Figure 4– Mount and hood for the transmitter

2.3.2 Installation of a sensor with a (elbowed or straight) sensor-holder perch and nozzle (**PONPPCC-PH/EH** or **PONPPCD-PH/EH**)

For immersing the sensor in a tank, it is better to use the elbowed sensor-holder perch:

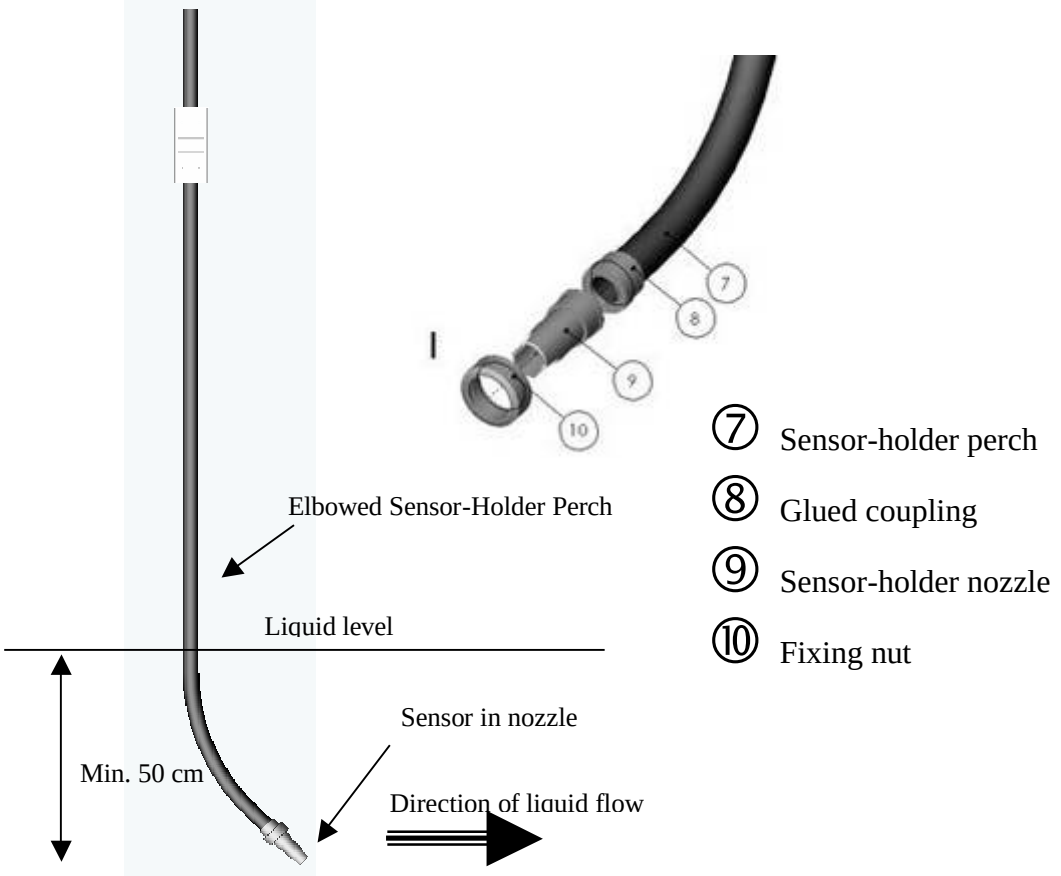


Figure 5- Elbowed Sensor-Holder Perch

Comment:

Use an elbowed sensor-holder in tanks that are heavily soiled in order to avoid the build up of fibres on the perch.

Installation of the pH sensor in the nozzle:

1) Dismantle the sensor-holder perch then remove the nozzle from the bottom of the perch by removing its tightening screw.
2) Introduce a solid wire into the perch then a string.
3) Take the sensor and remove its protective casing and two ring-type joints.

Henceforth, handle the sensor with care. Breakage of the glass bulb is not covered by the guarantee.

4) Attach the end of the sensor to the string and lower it from the top to the bottom of the perch by pulling on the string.
5) Remove the string then place the sensor in the nozzle and let it protrude by around twenty centimetres.
6) Replace only the ring-type joint nearest to the glass part.
7) Leave the tip of the sensor flush with the end of the nozzle, to within a millimetre. Fasten the sensor in place by screwing the tightening screw.
8) Replace the nozzle on the perch and fasten it using the tightening screw.
9) Set the perch in a vertical position using our stand with slider or other sort of system. Adjust the immersion parameters so that the nozzle always remains immersed and so that the more than 0.50 cm is immersed.
10) Position the sensor so that direction of liquid flow comes from behind the nozzle in order to avoid the build up of fibres.

Diagram of the sensor in the nozzle without the cleaning system.

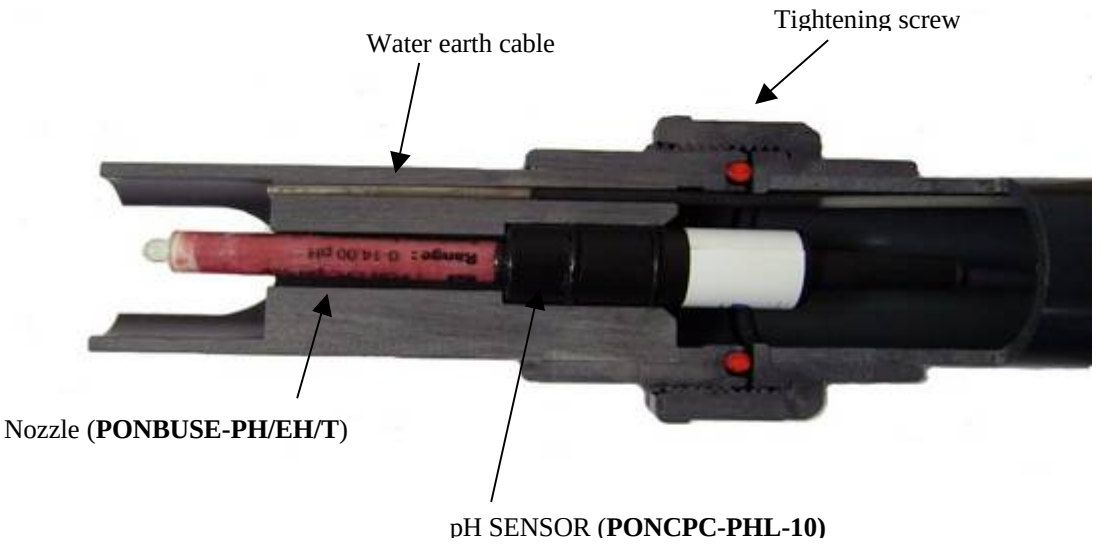


Figure 6– Nozzle for sensor without cleaning system

Comment: The line out cable is to be connected to the ACTEON 200 earth terminal.

2.3.3 Installation of an ESHP (Elbowed Sensor-Holder Perch) or SSHP (Straight Sensor-Holder Perch) on a QRPM (Quick Release Perch Mount) (PONSPFR and PONSPFR2)

1) Fix the stainless steel QRPM to the infrastructure.
2) Next, fix a sensor-holder perch to the stainless steel QRPM as shown in the diagram below.

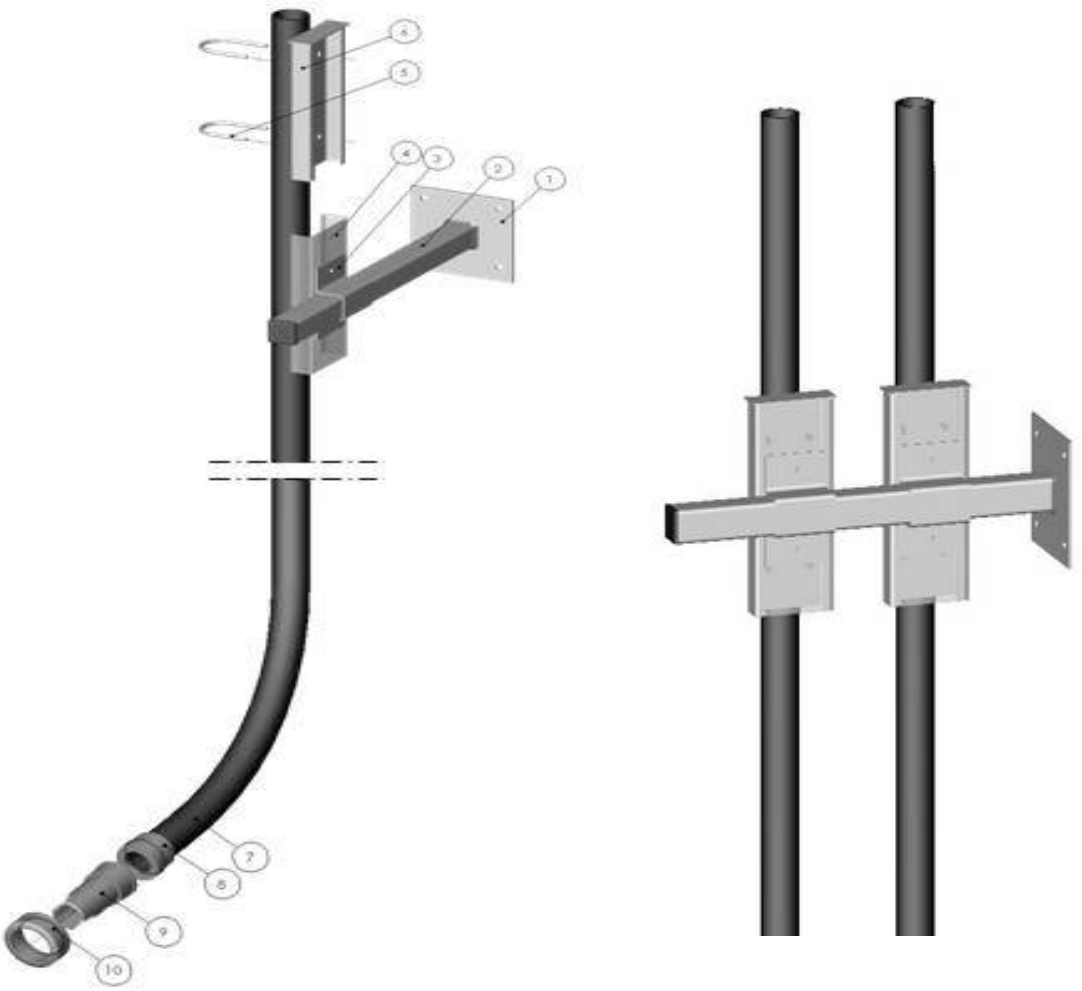


Figure 7– Installation of a perch on a QPRM with one or two sliders

It is possible to install a second slider in order to install a second sensor-holder perch for the temperature sensor (see diagram above).

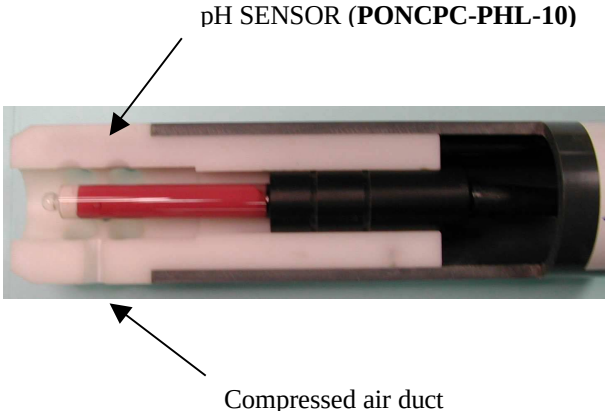
2.3.4 Installation of a pH sensor cleaning system

So as to lengthen the time between each clean, use the compressed air cleaning system (**PONCA-HXI**).

1) Dismantle the sensor-holder perch then remove the nozzle from the bottom of the perch by removing its tightening screw.
2) Introduce a solid wire into the perch then a string.
3) Take the sensor and remove its protective casing and two ring-type joints.

Henceforth, handle the sensor with care. Breakage of the glass bulb is not covered by the guarantee.

4) Attach the end of the sensor to the string and lower it from the top to the bottom of the perch by pulling on the string.
5) Remove the string then place the sensor in the nozzle and let it protrude by around twenty centimetres.
6) Replace only the ring-type joint nearest to the glass part.
7) Leave the tip of the sensor flush with the end of the nozzle, to within a millimetre. Fasten the sensor in place by screwing the tightening screw.
8) Replace the nozzle on the perch and fasten it using the tightening screw.
9) Set the perch in a vertical position using our stand with slider or other sort of system. Adjust the immersion parameters so that the nozzle always remains immersed and so that the more than 0.50 cm is immersed.
10) Position the sensor so that direction of liquid flow comes from behind the nozzle in order to avoid the build up of fibres.



2.4 Installation mounted inside pipes:

For installations mounted inside pipes, use the tee assembly (**PON-4020**) and the adapter sleeve (**PONAP1**).

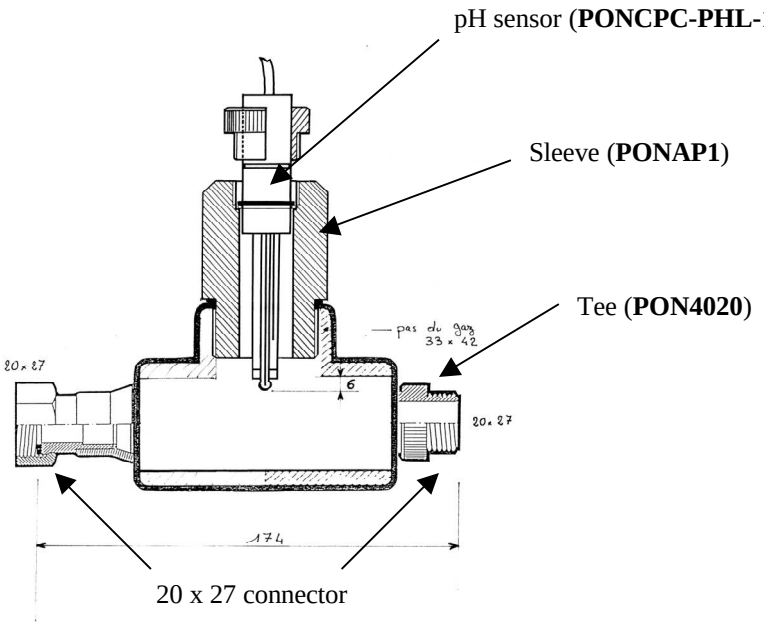


Figure 8- Installation of a pH sensor mounted inside a pipe

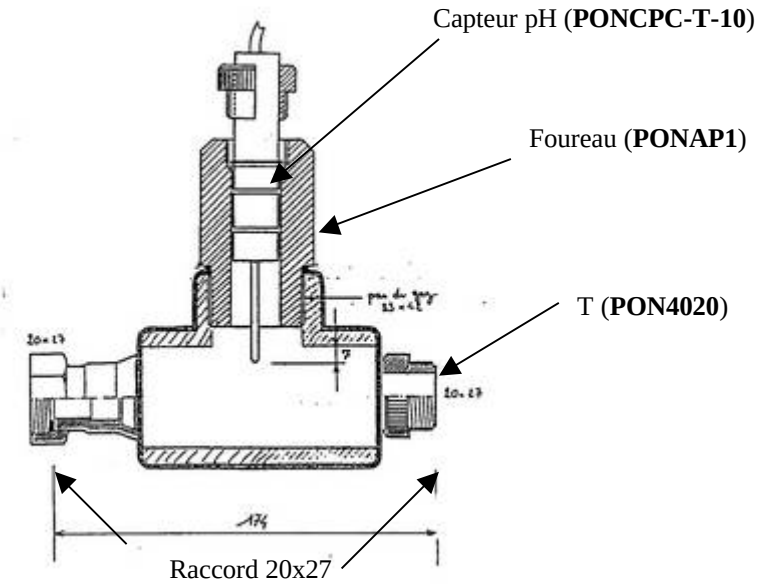


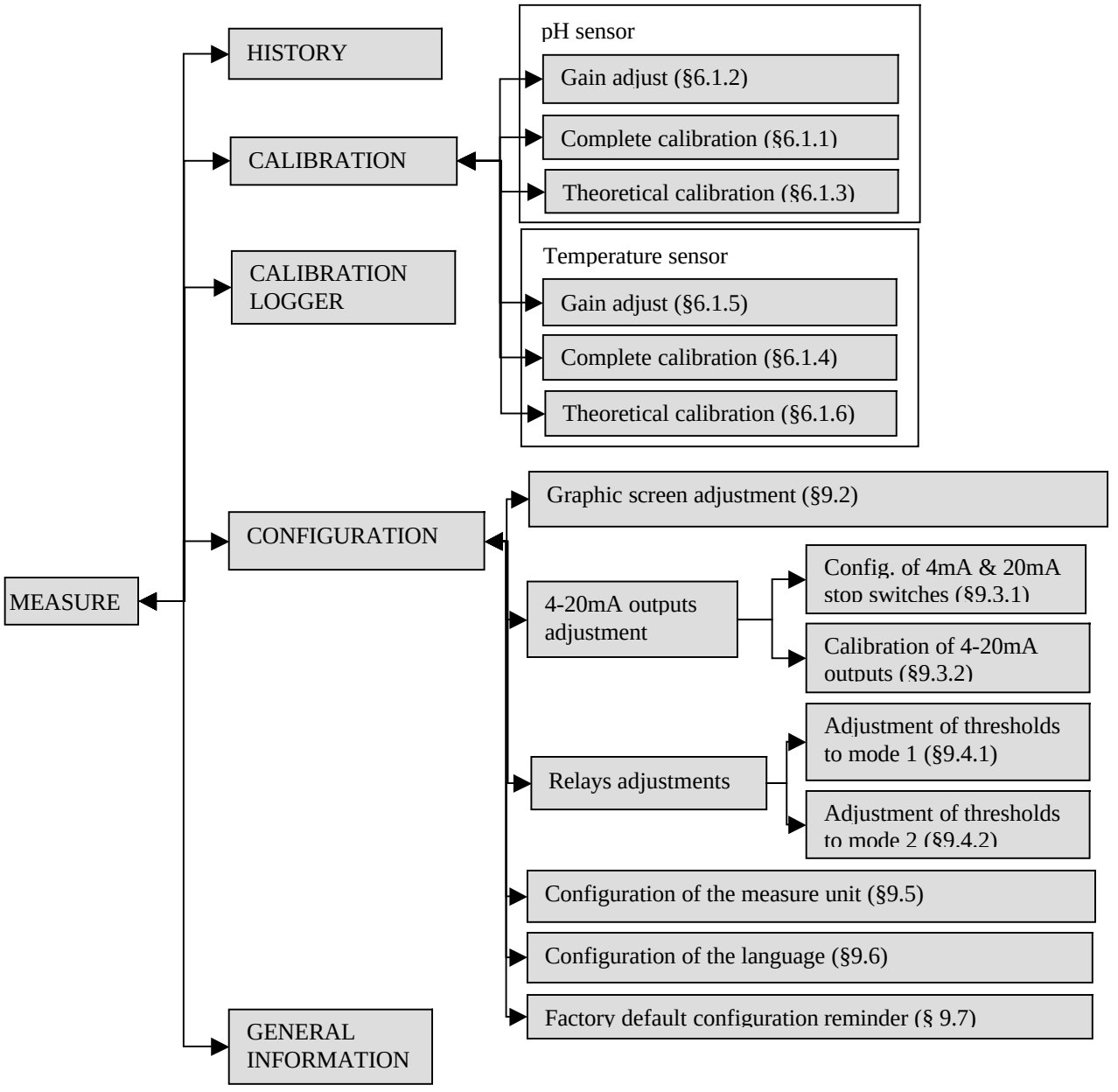
Figure 9- Installation of a temperature sensor mounted inside a pipe

3 The ACTEON 2010 transmitter

3.1 Control console

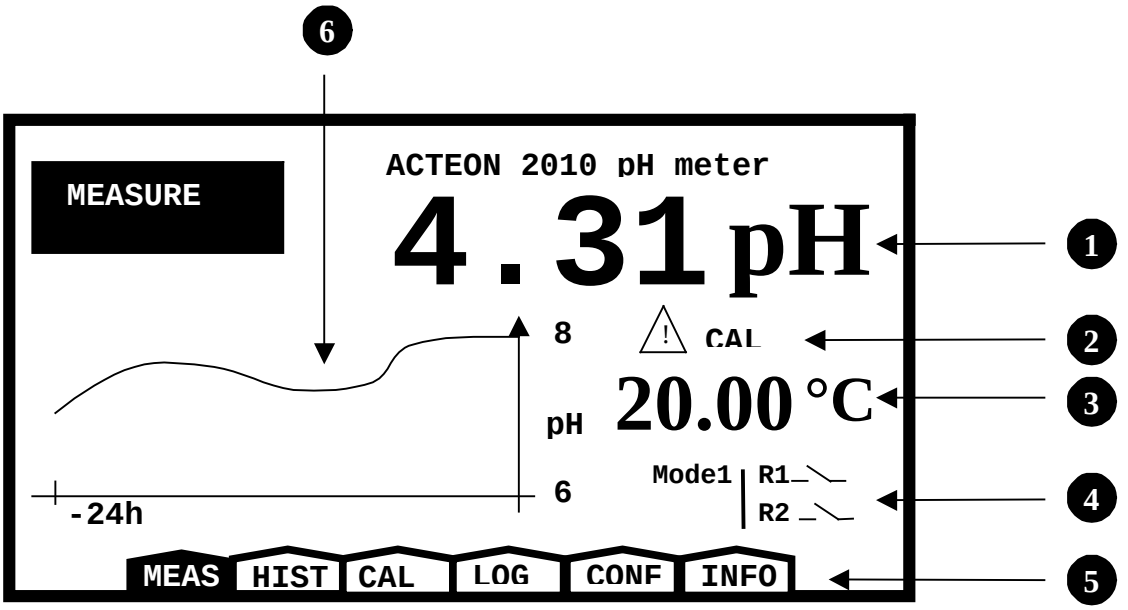
1. ENTER key for accessing menus or validating actions
2. ESC key for exiting menus or cancelling actions
3. ◁ key to move left in menus
4. ▷ key to move right in menus
5. △ key to increase a value or select the menu above
6. ▽ key to decrease a value or select the menu below
7. Control screen
8. Quarter turn to lock the cover

4 Summary of ACTEON 2010 menus



5 The measure window

In measure mode the measure screen displays various information:



1. The pH measurement (offset in temperature)
2. Indicator of measurement status:

   (!) CAL THEOR : This icon signifies that the calibration coefficients are the theoretical coefficients

   ⚠ CAL : This icon signifies that the calibration point of the sensor is not correct.

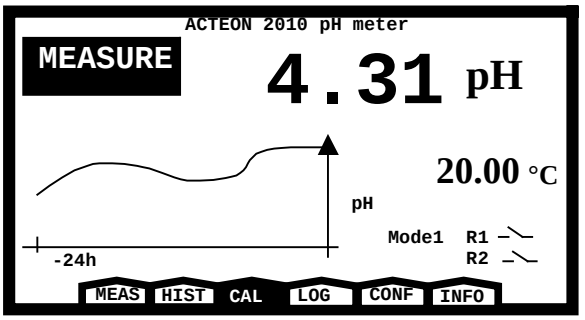
   : If there is no icon, this means that the last calibration is correct.

3. Temperature transmitted by the temperature sensor
   If the sensor is not installed or the wiring is faulty, the temperature is not displayed and the temperature offset is brought down to 20°C.
4. Status and operating mode of relays R1 and R2:
   ⊣\⊢ The contact is inactive.
   ⊣⊢ The contact is active.
5. ACTEON menu
6. Trend curve configurable from 1 minute to 24 hours (with automatic scaling)

6 Calibrating the ACTEON 2010

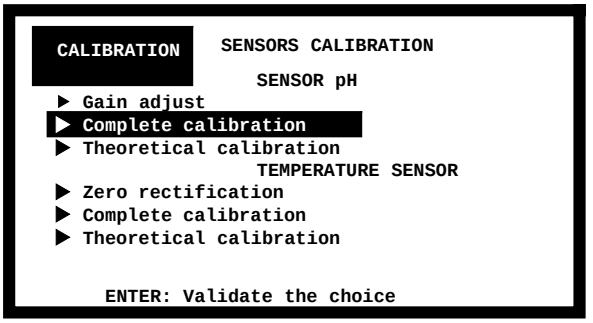
6.1 Calibrating the sensors

In the measure window, select the calibration menu:



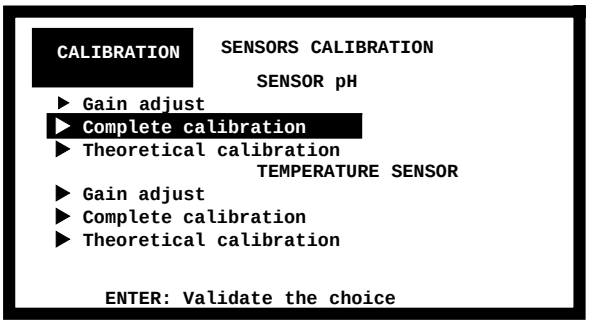
Use the ▷ and ◁ keys to move about the ACTEON

Select the CAL menu then press the ENTER key.



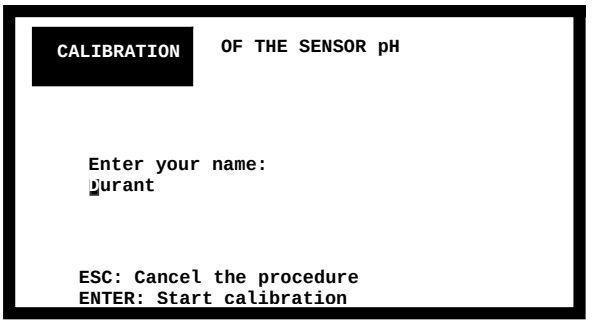
6.1.1 Calibrating the pH sensor at two points (complete calibration)

The following procedure enables complete calibration of your pH sensor.
It is necessary to use the 7.01 and 4.01 or 10.01 buffer solutions for this procedure.



Use the △ and ▽ keys to select the type of calibration and sensor to be calibrated.

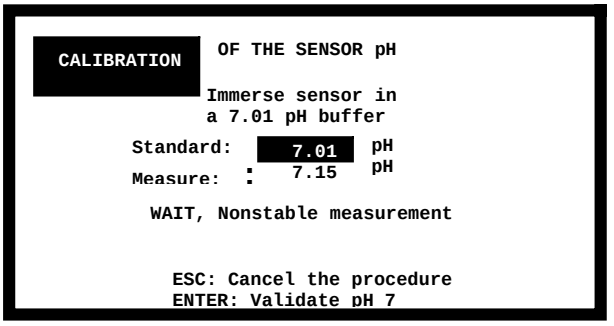
Select the ▶ Complete calibration menu then press the ENTER key.



Use the ▷and◁ keys to move in the name.
Use the △and▽ keys to change the letters.

Once you have entered your name or reference, press the ENTER key.

Immerse the sensor in the pH 7.01 buffer solution



Use the △and▽ keys to adjust the value of the buffer.

AWAIT MEASUREMENT STABILISATION.

To validate the first calibration point, press the ENTER key.

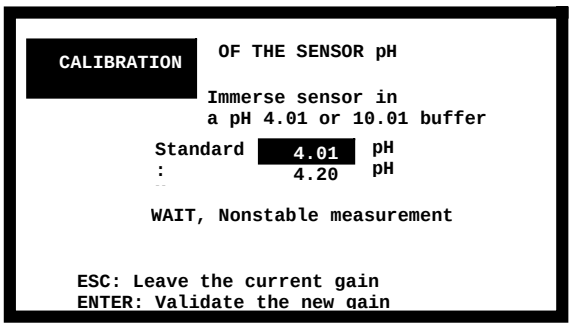
Calibration Correct ?

No

If the first calibration point is not correct, an error message window appears (see "information on error messages" chapter §6.2).

Yes

Immerse the sensor in the pH 4.01 or 10.01 buffer solution.

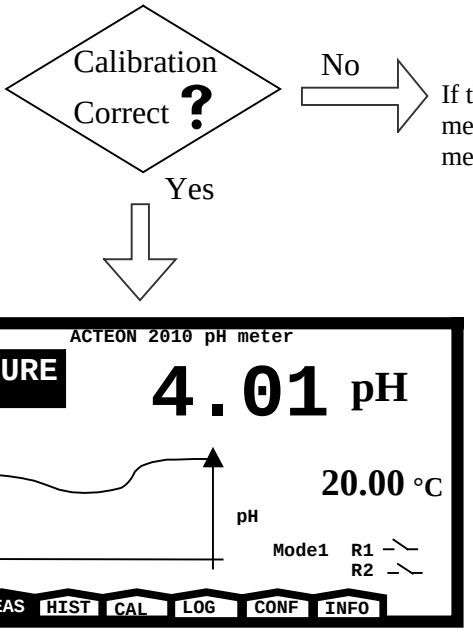


Use the △and▽ keys to adjust the value of the buffer (from 4.98 to 10.13).

AWAIT MEASUREMENT STABILISATION .

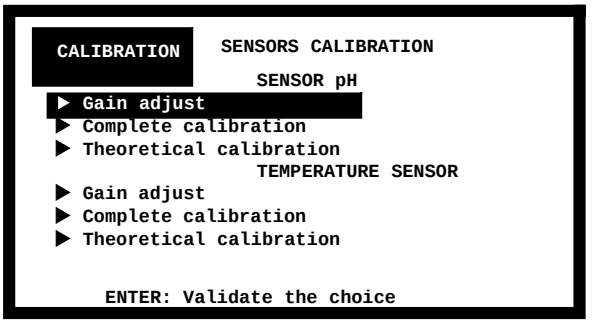
To validate the second calibration point, press the ENTER key.

.


Calibration
Correct ?
No
Yes
If the second calibration point is not correct, an error message window appears (see "information on error messages" chapter §6.2.2).
ACTEON 2010 pH meter
MEASURE
4.01 pH
20.00 °C
pH
Mode1 R1
R2
-24h
MEAS HIST CAL LOG CONF INFO

6.1.2 Adjusting the slope of the pH sensor

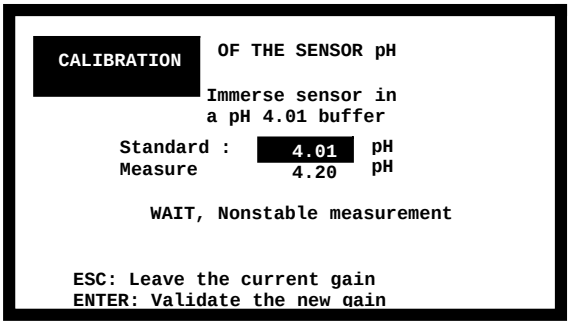
If you observe a small measurement error, you may only adjust the slope of your sensor by implementing the following procedure:



Use the △ and ▽ keys to select the type of calibration and sensor to be calibrated.

Select the ▶ Gain adjust menu then press the ENTER key.

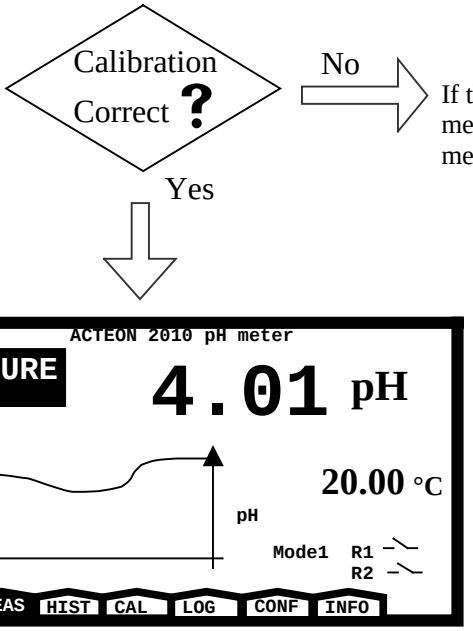
Immerse the sensor in the pH 4.01 or 10.01 buffer solution.



Use the △and▽ keys to adjust the value of the buffer (from 4.00 to 10.98).

AWAIT MEASUREMENT STABILISATION.

To validate the gain adjustment, press the ENTER key.

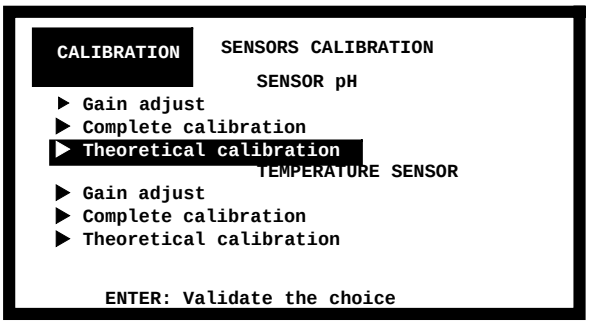


If the second calibration point is not correct, an error message window appears (see "information on error messages" chapter §6.2.2).

6.1.3 Returning to theoretical calibration for measurement of pH

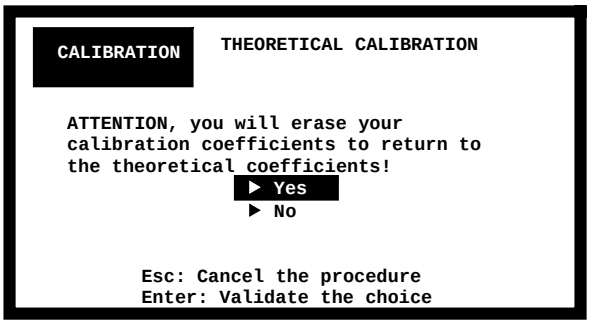
The theoretical calibration enables a return to the theoretical coefficients (Nernst slope and zeroing the pH sensor offset).

Follow the instructions below to carry out a theoretical calibration:



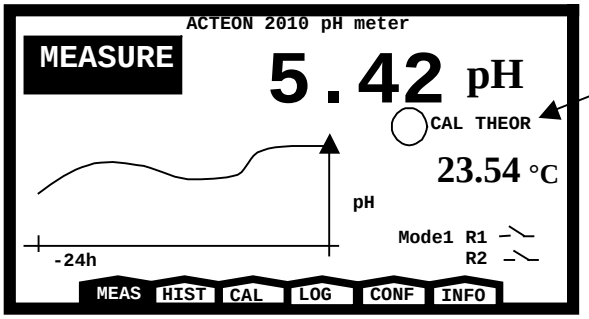
Use the △ and ▽ keys to select the type of calibration and sensor to be calibrated.

Select the ▶ Theoretical calibration menu then press the ENTER key.


CALIBRATION
THEORETICAL CALIBRATION
ATTENTION, you will erase your calibration coefficients to return to the theoretical coefficients!
▶ Yes
▶ No
Esc: Cancel the procedure
Enter: Validate the choice

Use the △and▽keys to select and confirm the procedure.

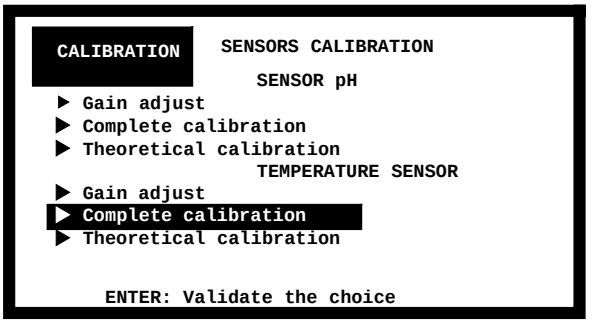
After correctly selecting ▶ Yes to return to the theoretical coefficients, press the ENTER key.



The icon showing that the device is calibrated with the theoretical coefficients appears.

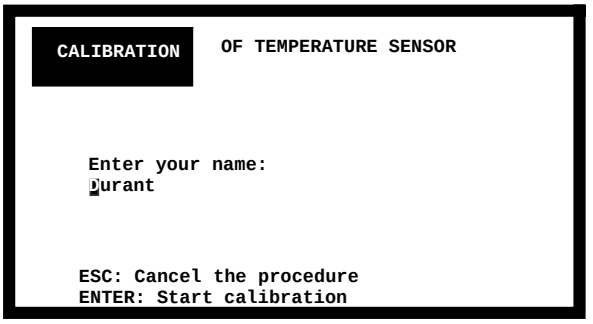
6.1.4 Calibrating the temperature sensor at two points (complete calibration)

The following procedure enables complete calibration of your temperature sensor.
A precision thermometer and water at 0°C are necessary for this procedure.



Use the △ and ▽ keys to select the type of calibration and sensor to be calibrated.

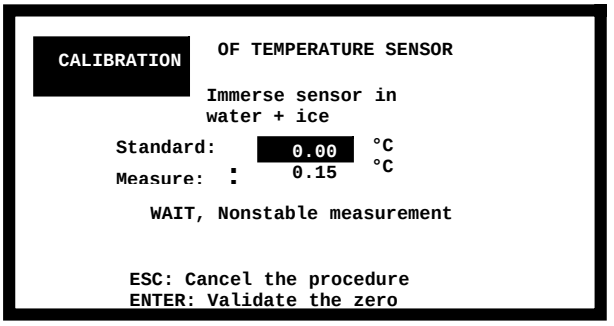
Select the Complete calibration menu for the temperature sensor then press the ENTER key.



Use the ▷ and ◁ keys to move in the name.
Use the △ and ▽ keys to change the letters.

Once you have entered your name or reference, press the ENTER key.

Immerse the sensor in a 0.00°C solution of water and crushed ice.



Use the △and▽ keys to adjust the value of the water temperature.

AWAIT MEASURELENT STABILISATION.

To validate the first calibration point, press the ENTER key.

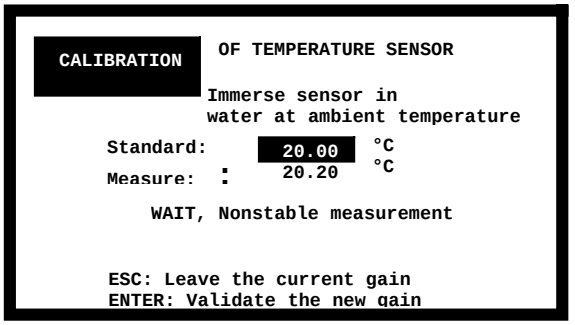
Calibration Correct ?

No

If the first calibration point is not correct, an error message window appears (see "information on error messages" chapter §6.3.1).

Yes

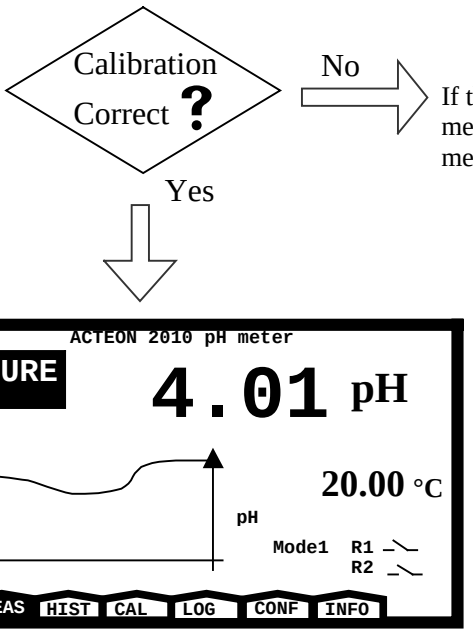
Immerse the sensor in the water at ambient temperature.



Use the △and▽ keys to adjust the value of the water temperature.

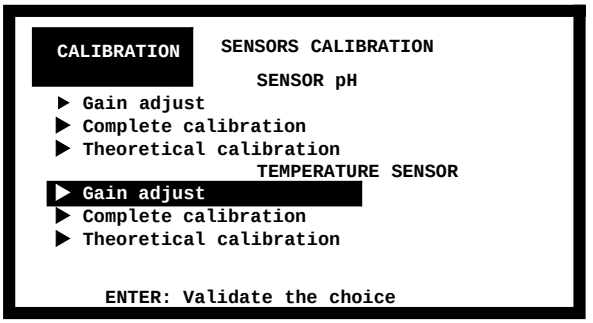
AWAIT MEASUREMENT STABILISATION.

To validate the second calibration point, press the ENTER key.


Calibration
Correct ?
No
If the second calibration point is not correct, an error message window appears (see "information on error messages" chapter §6.2.2).
Yes
ACTEON 2010 pH meter
MEASURE
4.01 pH
20.00 °C
pH
Mode1
R1
R2
-24h
MEAS
HIST
CAL
LOG
CONF
INFO

6.1.5 Adjusting the slope of the temperature sensor

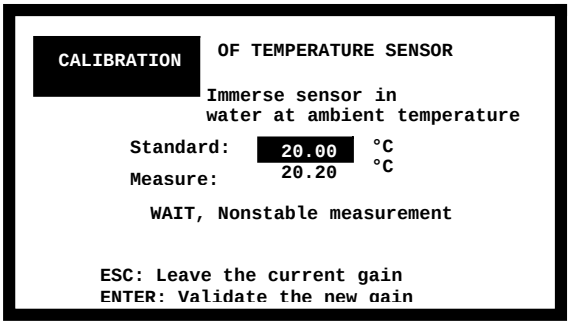
If you observe a small measurement error, you may only adjust the slope of your sensor by implementing the following procedure:



Use the △ and ▽ keys to select the type of calibration and sensor to be calibrated.

Select the ▶ Gain adjust menu for the temperature sensor then press the ENTER key.

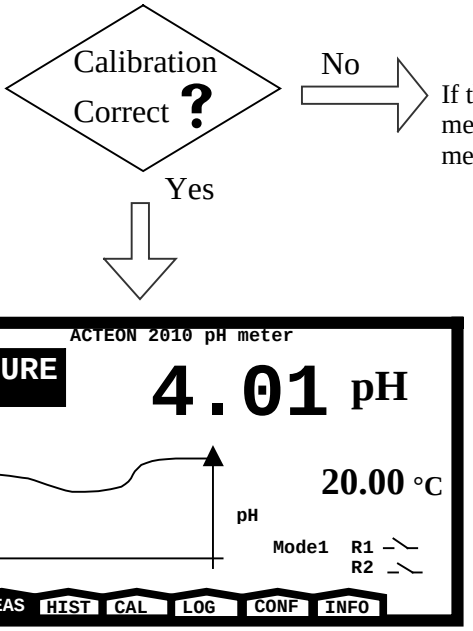
Immerse the sensor in the water at ambient temperature.



Use the △and▽ keys to adjust the temperature value of the water at ambient temperature.

AWAIT MEASUREMENT STABILISATION.

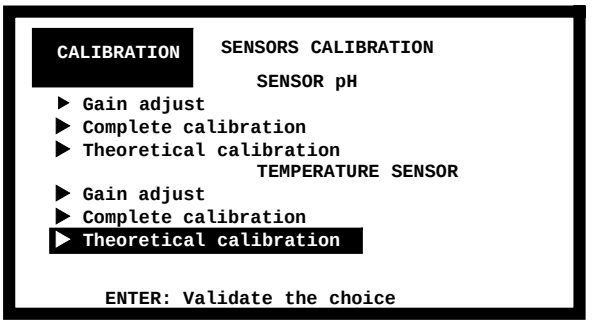
To validate the gain adjustment, press the ENTER key.



If the second calibration point is not correct, an error message window appears (see "information on error messages" chapter §6.3.2).

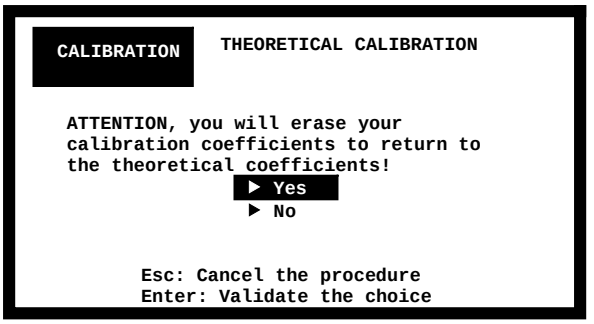
6.1.6 Returning to theoretical calibration for temperature measurement

The theoretical calibration enables a return to the theoretical coefficients (PT100 theoretical slope and zeroing of the offset).
Follow the instructions below to carry out a theoretical calibration:



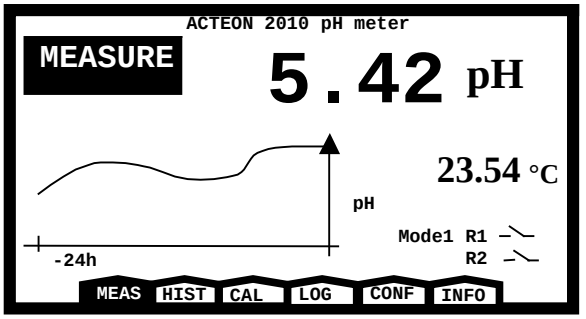
Use the △ and ▽ keys to select the type of calibration and sensor to be calibrated.

Select the ▶ Theoretical calibration menu then press the ENTER key.


CALIBRATION
THEORETICAL CALIBRATION
ATTENTION, you will erase your calibration coefficients to return to the theoretical coefficients!
▶ Yes
▶ No
Esc: Cancel the procedure
Enter: Validate the choice

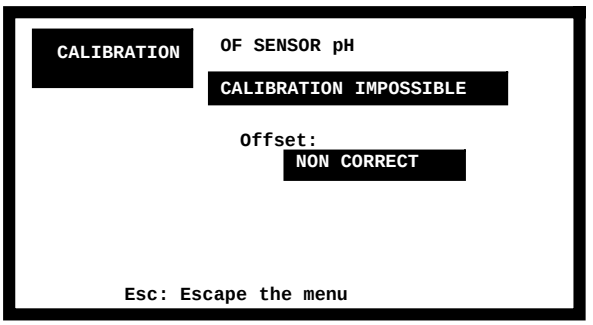
Use the △and▽keys to select and confirm the procedure.

After correctly selecting ▶ Yes to return to the theoretical coefficients, press the ENTER key.



6.2 Information on error messages during calibration of the pH sensor

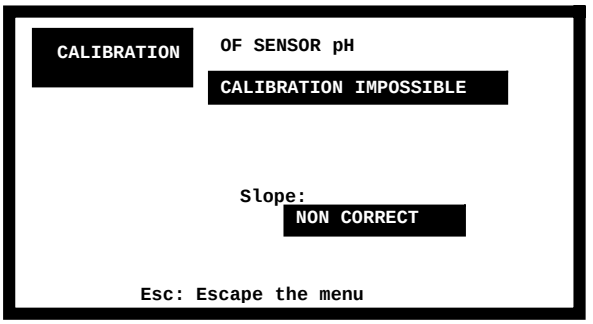
6.2.1 Error during calibration with the pH 7.01 buffer



If you observe an error during calibration with the pH 7.01 buffer:

1) Check that the buffer is not fouled or out-of-date.
2) Check that the pH bulb of the sensor is not soiled.

6.2.2 Error during calibration with the pH 4.01 buffer

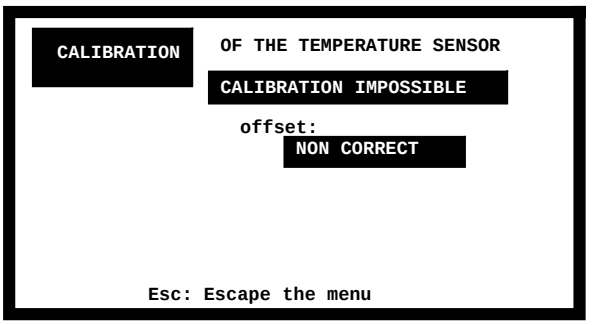


If you observe an error during calibration with the pH 4.01 buffer:

1) Check that the buffer is not fouled or out-of-date.
2) Check that the port for the bridge is not blocked.

6.3 Information on error messages during calibration of the temperature sensor

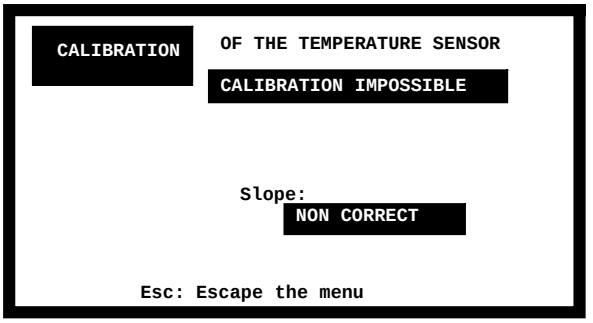
6.3.1 Error during calibration at 0°C.



If you observe an error during calibration in the water at 0°C:

1) Check the water temperature with a precision thermometer.
2) Check the connection between the temperature sensor and ACTEON 2000.

6.3.2 Error during calibration with water at ambient temperature



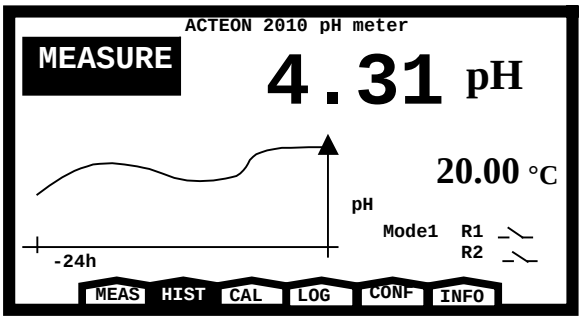
If you observe an error during calibration in the water at ambient temperature:

1) Check the water temperature with a precision thermometer.
2) Check the connection between the temperature sensor and ACTEON 2000.

7 VIEWING THE MEASUREMENT HISTORY

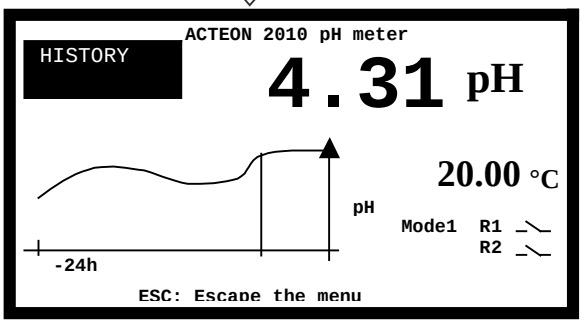
The history menu allows consultation of the last 100 items of data recorded and displayed on the trend curve.

To view this data, follow the instructions below:



Use the ▷ and ◁ keys to move about the ACTEON menu.

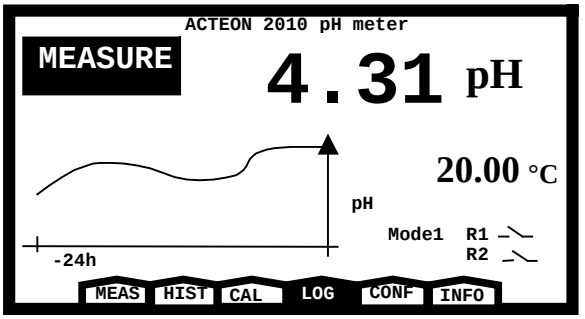
Select the HIST menu then press the ENTER key.



Use the ▷ and ◁ keys to move along the trend curve.

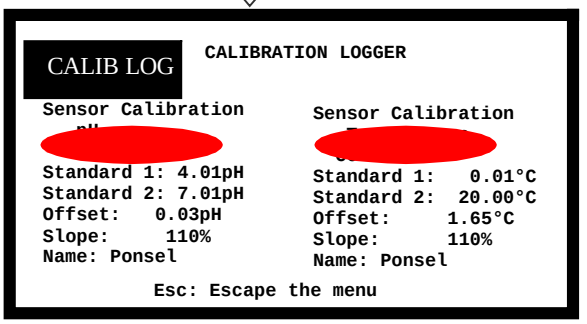
8 VIEWING THE SENSOR CALIBRATION REPORT

The calibration logger enables the reports for the most recent calibrations to be checked.
To access this information follow the instructions below:



Use the ▷ and ◁ keys to move about the ACTEON menu.

Select the LOG menu then press the ENTER key.



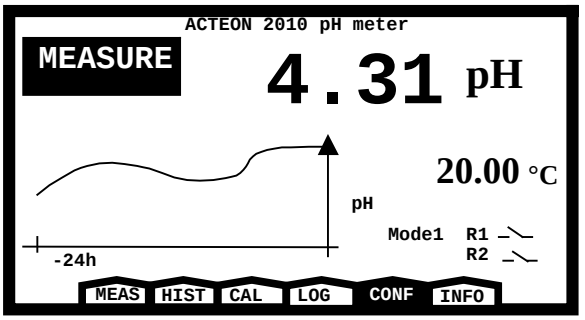
This window allows a diagnostic of whether any errors have occurred in the most recent calibrations.

List of diagnostic messages from the last calibration:

Message	Explanation
CORRECT	ACTEON 2000 has been calibrated correctly.
THEORETICAL coef.	ACTEON 2000 is using the theoretical coefficients (slope and offset); this message is displayed after a theoretical calibration.
THEORETICAL slope	ACTEON 2000 is using the theoretical slope.
THEORETICAL offset	ACTEON 2000 is using the theoretical offset.
INCORRECT slope	ACTEON 2000 is incorrectly calibrated because the slope calculated during calibration is incorrect (in this case ACTEON 2000 is using the last correctly calculated slope).
INCORRECT offset	ACTEON 2000 is incorrectly calibrated because the offset calculated during calibration is incorrect (in this case ACTEON 2000 is using the last correctly calculated offset).

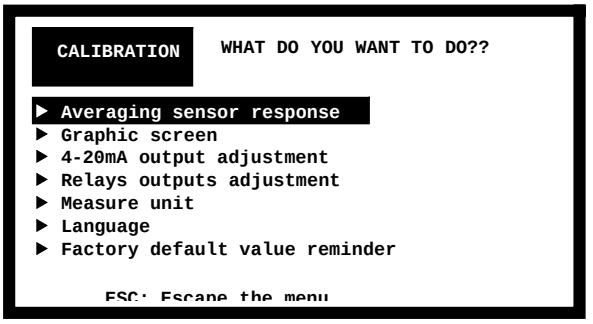
9 CONFIGURING ACTEON 2000

In the measure window, select the configuration menu:



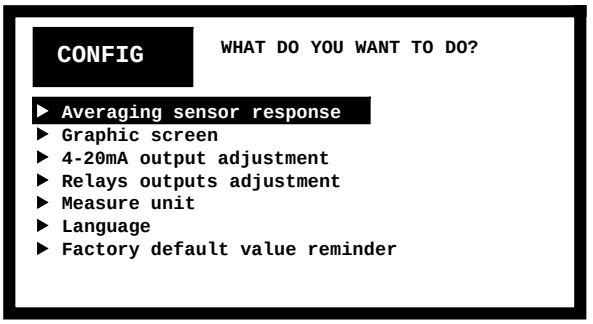
Use the ▷ and ◁ keys to move about the ACTEON

Select the **CONF** menu then press the ENTER key.



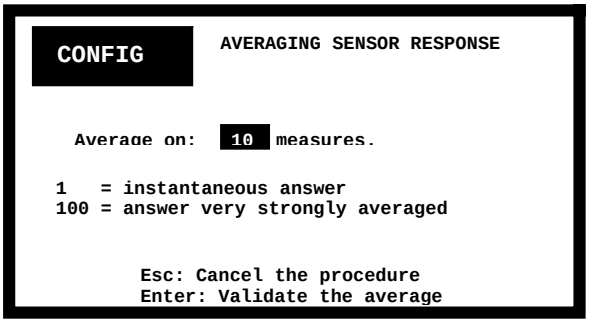
9.1 Configuring the averaging of the sensor response

This configuration provides greater stability or increased responsiveness of the sensor response.
By default, the averaging takes account of 10 measurements. This means that the value read is the average measurement over the last 10 seconds:



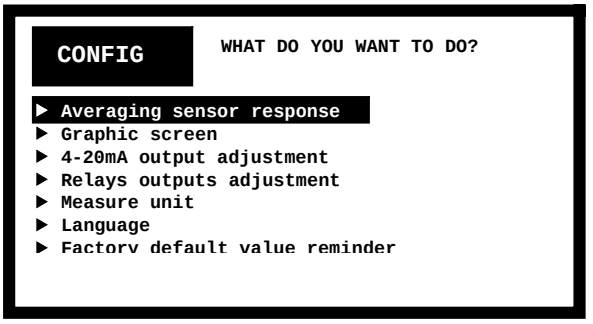
Use the △and▽ keys to select the desired configuration.

Select the Averaging sensor response menu then press the ENTER key.



Use the △and▽ keys to increase and decrease the averaging.

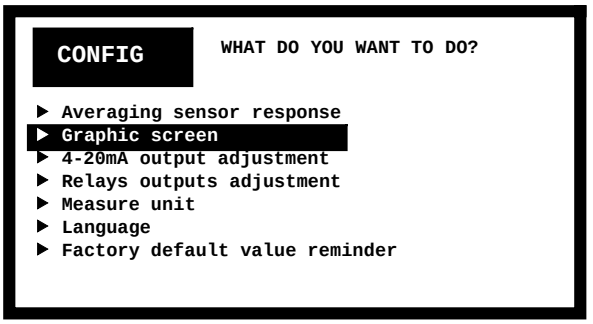
Select the required averaging then press the ENTER key.



Comment:
If your measurement is unstable, increase the averaging.
If your measurement is too slow, decrease the averaging.

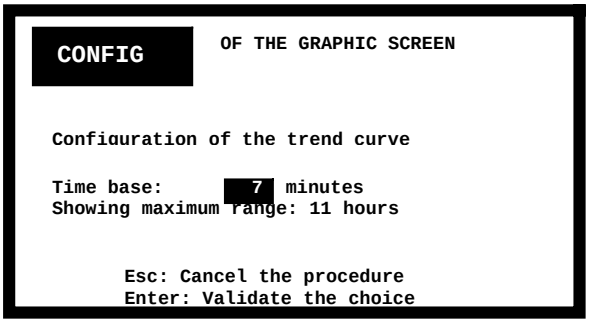
9.2 Configuring the trend curve

The trend curve can be used to check a regulation cycle or detect anomalies.
In order to adapt the time base to the trend curve, follow the instructions below:



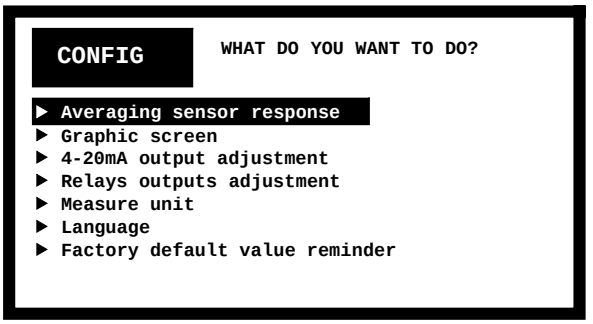
Use the △and▽ keys to select the desired configuration.

Select the ▶ Graphic screen menu then press the ENTER key.



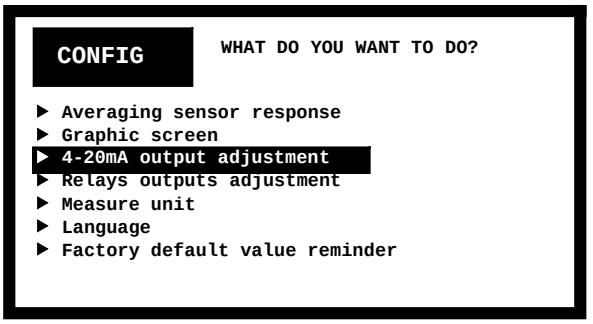
Use the △and▽ keys to increase and decrease the time base so as to adjust the duration of the trend curve (from 1 sec. to 15 min.).

Select the required time base then press the ENTER key.



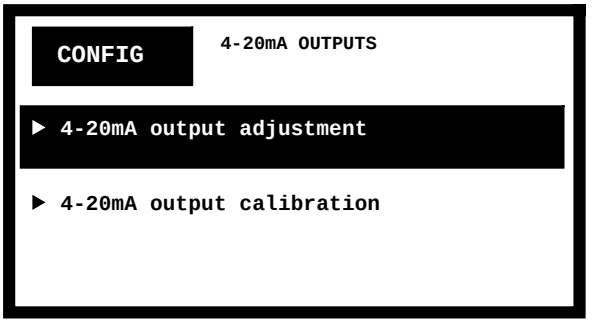
9.3 Configuring the two 4-20mA outputs

Comment:
In order to obtain greater precision for the 4-20mA outputs, it is recommended to calibrate them during activation.

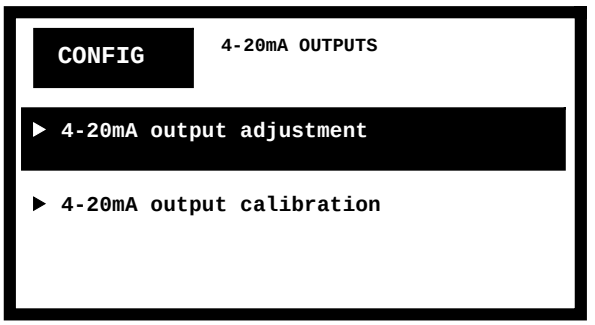


Use the △and▽ keys to select the desired configuration.

Select the ▶ 4-20mA output adjustment menu then press the ENTER key.

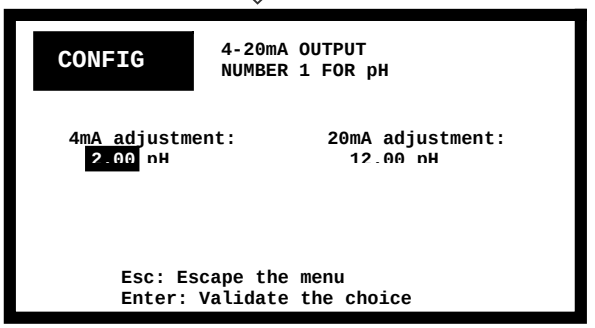


9.3.1 Adjusting the stopped thresholds for the 4-20mA outputs



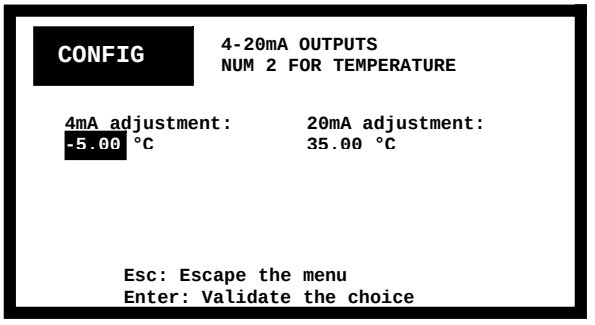
Use the △and▽ keys to select the desired configuration.

Select the **4-20mA output adjustment** menu then press the ENTER key.



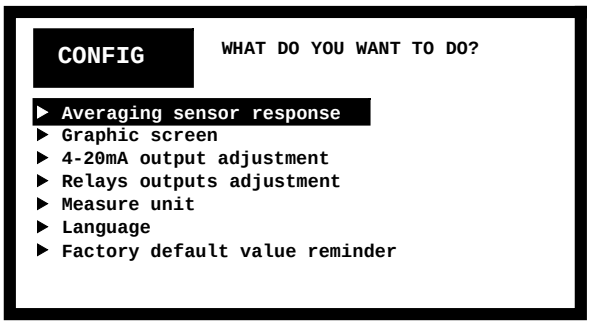
Use the △and▽ keys to increase and decrease the values of the 4 and 20mA stops.
Use the ◁ and ▷ keys to select either the 4mA or 20mA stop.

Once the 4-20mA output is correctly configured for the pH, press the ENTER key.



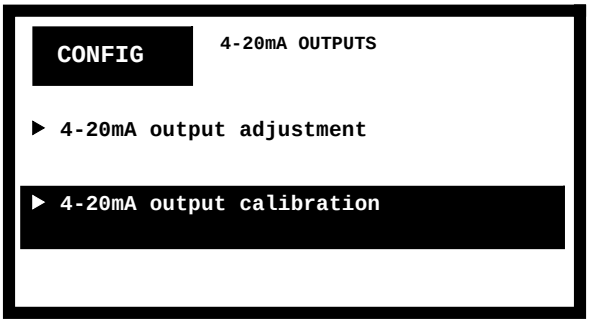
Use the △and▽ keys to increase and decrease the values of the 4 and 20mA stops.
Use the ◁ and ▷ keys to select either the 4mA or 20mA stop.

Once the 4-20mA output is correctly configured for the temperature, press the ENTER key.



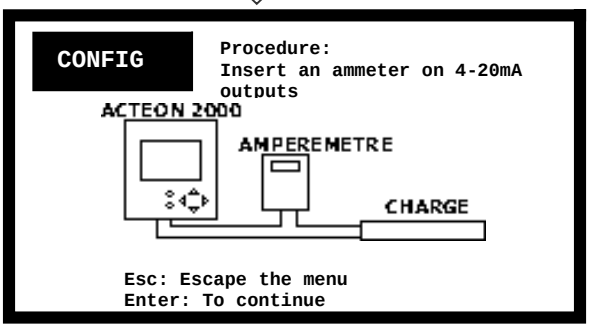
9.3.2 Calibrating the 4-20mA outputs

Calibrating the 4-20mA outputs enables their precision to be improved by taking into account the load of your device.

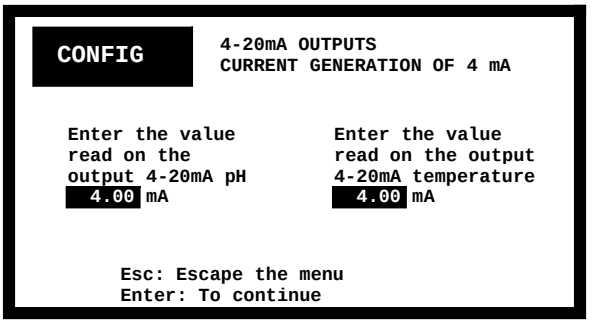


Use the △and▽ keys to select the desired configuration.

Select the ▶ 4-20mA output calibration menu then press the ENTER key.

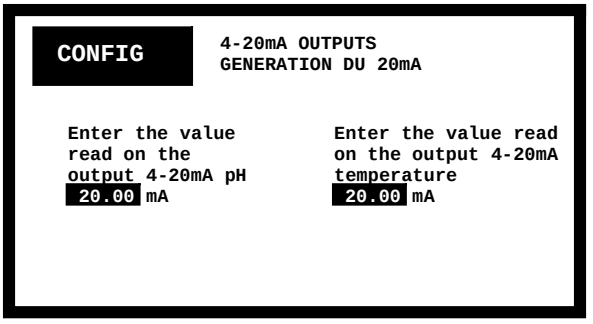


Once the 4-20mA output is correctly configured for the pH, press the ENTER key.


CONFIG
4-20mA OUTPUTS
CURRENT GENERATION OF 4 mA
Enter the value read on the output 4-20mA pH
4.00 mA
Enter the value read on the output 4-20mA temperature
4.00 mA
Esc: Escape the menu
Enter: To continue

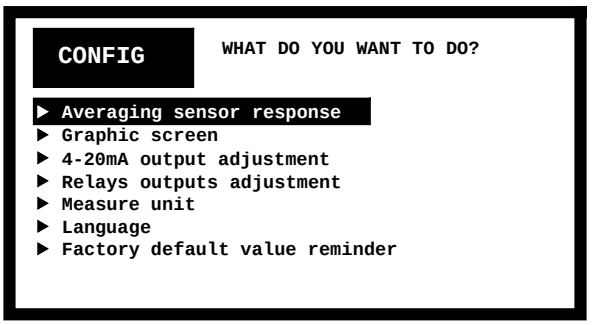
Use the △and▽ keys to increase and decrease the 4mA value.
Use the ◁ and ▷ keys to select either the 4-20mA output for the pH or the 4-20mA output for the temperature.

Once the 4mA outputs are correctly adjusted, press the ENTER key.


CONFIG
4-20mA OUTPUTS
GENERATION DU 20mA
Enter the value read on the output 4-20mA pH
20.00 mA
Enter the value read on the output 4-20mA temperature
20.00 mA

Use the △and▽ keys to increase and decrease the 20mA value.
Use the ◁ and ▷ keys to select either the 4-20mA output for the pH or the 4-20mA output for the temperature.

Once the 20mA outputs are correctly adjusted, press the ENTER key.

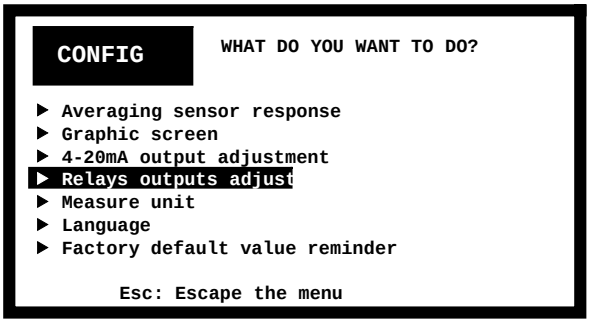


9.4 Adjusting the relay outputs

The 2 relays can be configured in 2 different modes:
- Mode 1 enables configuration of relay R1 on a pH measurement value and relay R2 on a temperature measurement value.
- Mode 2 enables configuration of relays R1 and R2 on two pH measurement values.

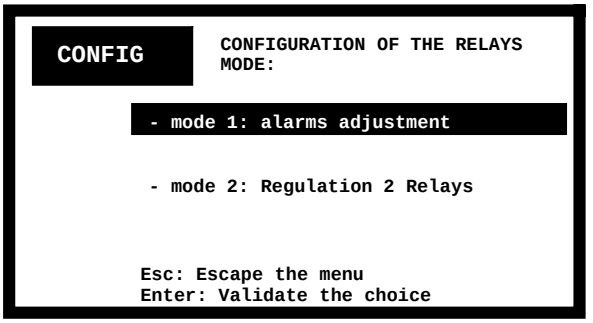
The 2 relays can be configured with the following attributes:

- Alarm threshold: threshold trigger value
- Hysteresis: hysteresis value for toggling of relays (the hysteresis enables pumping phenomena on the relays to be avoided)
- Triggering direction:
  - Above: this means the relay's contact is closed above the alarm threshold
  - Below: this means the relay's contact is open below the alarm threshold



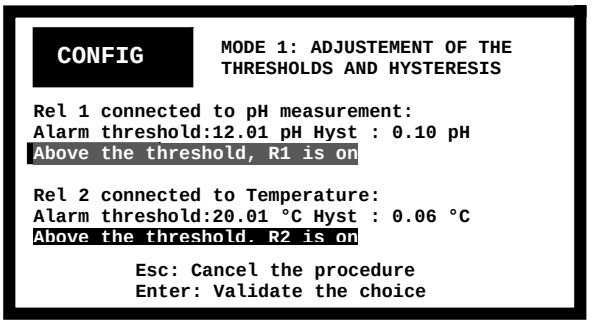
Use the △and▽ keys to select the desired configuration.

Select the ▶ Relays outputs adjustment menu then press the ENTER key.


CONFIG
CONFIGURATION OF THE RELAYS MODE:
- mode 1: alarms adjustment
- mode 2: Regulation 2 Relays
Esc: Escape the menu
Enter: Validate the choice

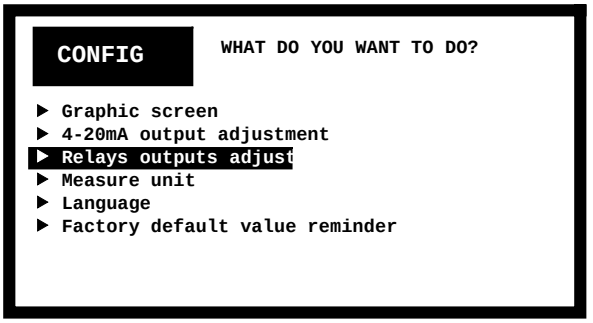
Use the △and▽ keys to select the desired configuration mode.

9.4.1 Configuring the relays in mode 1

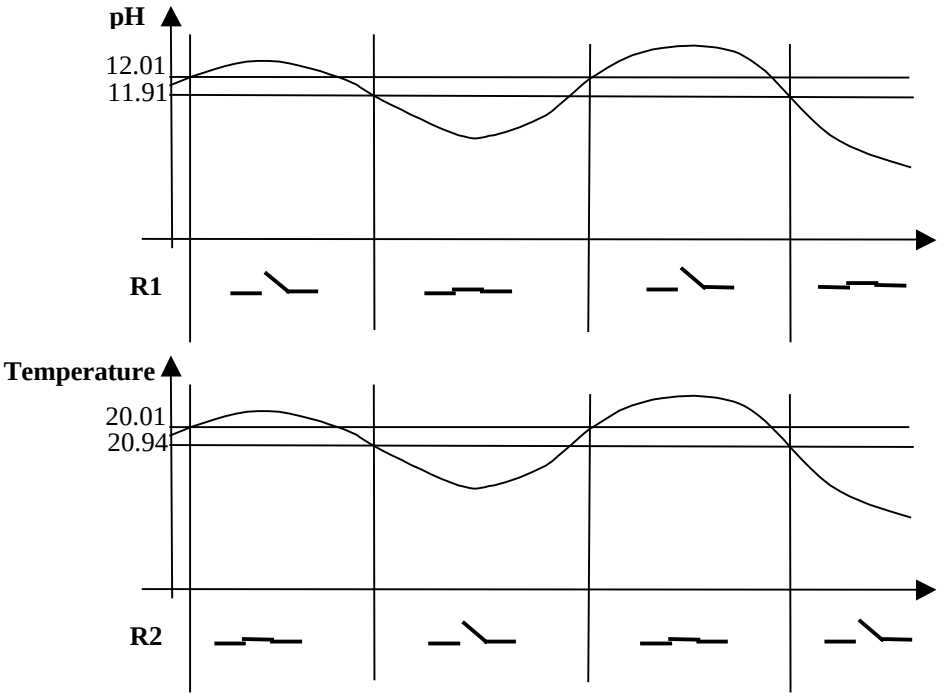

CONFIG
MODE 1: ADJUSTEMENT OF THE THRESHOLDS AND HYSTERESIS
Rel 1 connected to pH measurement:
Alarm threshold:12.01 pH Hyst : 0.10 pH
Above the threshold, R1 is on
Rel 2 connected to Temperature:
Alarm threshold:20.01 °C Hyst : 0.06 °C
Above the threshold, R2 is on
Esc: Cancel the procedure
Enter: Validate the choice

Use the △and▽ keys to increase and decrease the values.
Use the ◁and▷ keys to move from selection to selection.

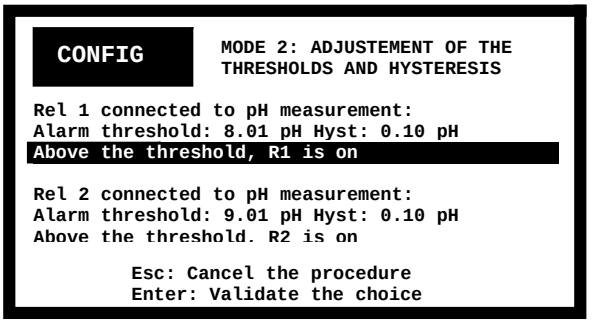
Once the two relays are correctly configured, press the ENTER key.



In the example below, the relays are configured thus:

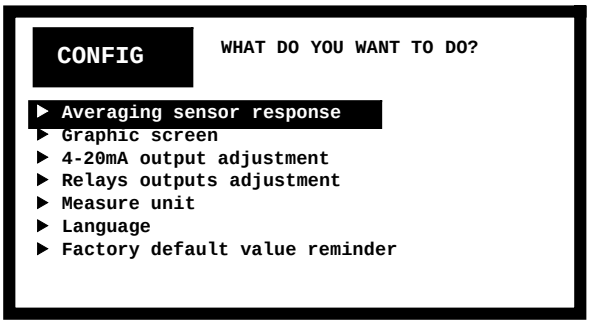


9.4.2 Configuring the relays in mode 2:

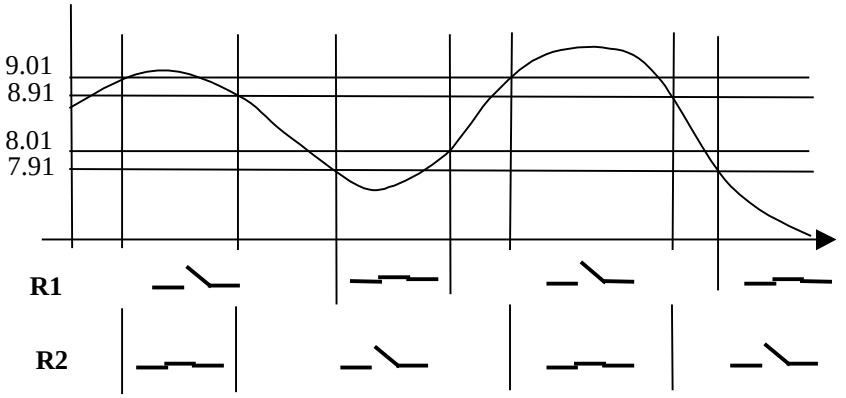

CONFIG
MODE 2: ADJUSTEMENT OF THE THRESHOLDS AND HYSTERESIS
Rel 1 connected to pH measurement:
Alarm threshold: 8.01 pH Hyst: 0.10 pH
Above the threshold, R1 is on
Rel 2 connected to pH measurement:
Alarm threshold: 9.01 pH Hyst: 0.10 pH
Above the threshold, R2 is on
Esc: Cancel the procedure
Enter: Validate the choice

Use the △and▽ keys to increase and decrease the values.
Use the ◁and▷ keys to move from selection to selection.

Once the two relays are correctly configured, press the ENTER key

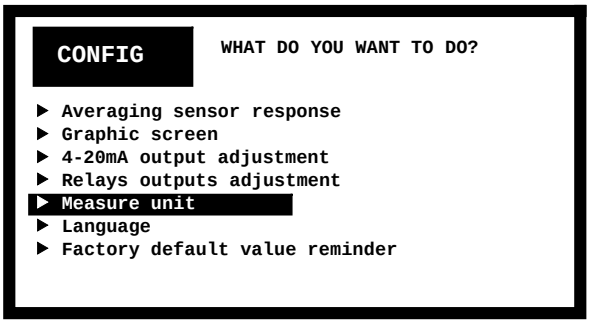


In the example below, the relays are configured thus:



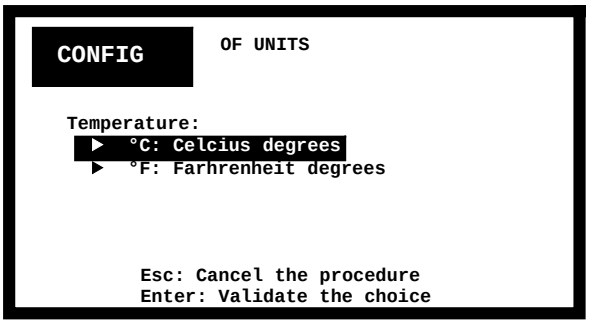
9.5 Adjusting the measure units:

The ACTEON 2000 can be configured in °C and in °F for temperature measurement.



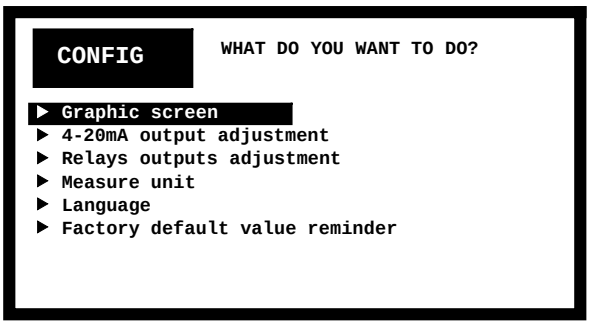
Use the △and▽ keys to select the desired configuration.

Select the ▶ Measure unit menu then press the ENTER key.



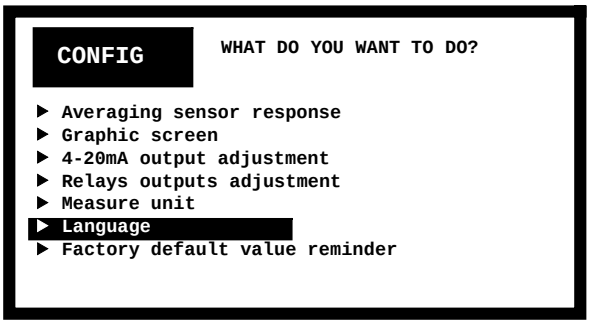
Use the △and▽ keys to select the desired measure unit.

Once the desired measure unit is correctly configured, press the ENTER key.



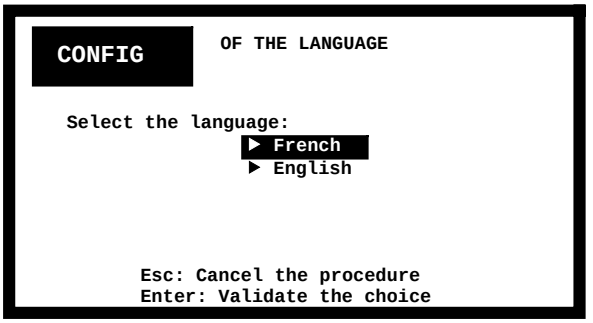
9.6 Setting the language:

ACTEON 2000 can be configured in French or in English.



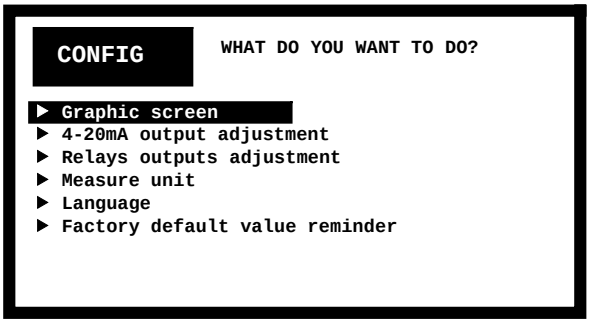
Use the △and▽ keys to select the desired configuration.

Select the ▶ Language menu then press the ENTER key.



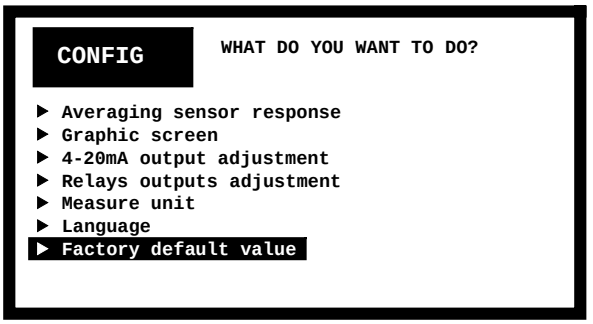
Use the △and▽ keys to select the desired language.

Once the desired language is correctly configured, press the ENTER key.



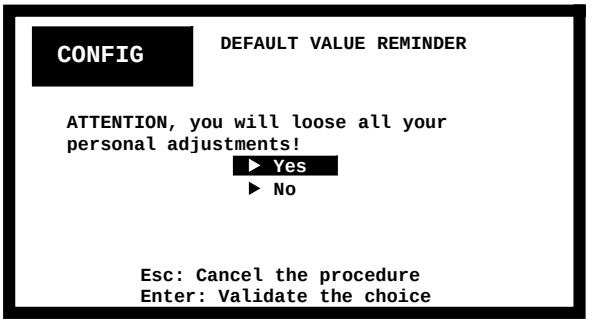
9.7 Returning to the factory default values:

ACTEON 2000 can be reinitialised with the default parameters:



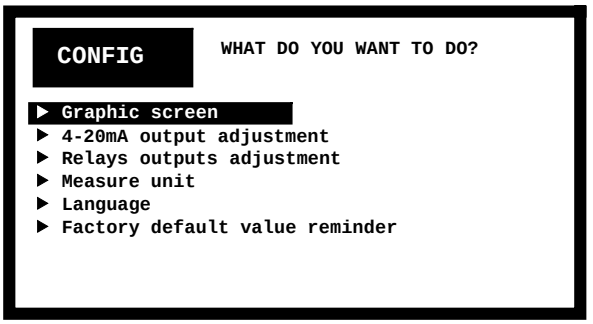
Use the △and▽ keys to select the desired configuration.

Select the ▶Default Value Reminder menu then press the ENTER key.



Use the △and▽keys to select and confirm the procedure.

Select ▶ Yes then press the ENTER key.

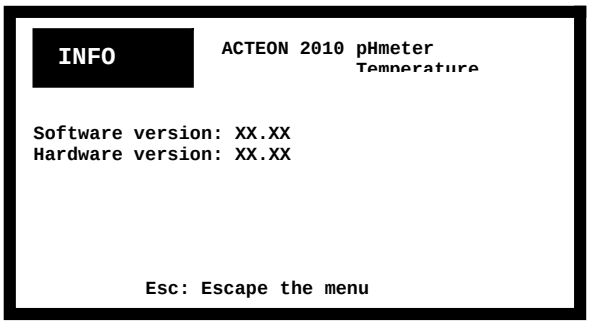


Subsequent to a factory default value reminder the ACTEON 2000 will be configured with the following parameters:

Averaging sensor response	10 measures
Time base for display of the trend curve	1 minute
4-20mA outputs adjustment	pH output: The 4mA stop is set to 2 pH and the 20mA stop is set to 12 pH Temp. °C output: The 4mA stop is set to -5°C and the 20mA stop is set to 35°C.
Relay outputs adjustment	The relays are configured in mode 1: R1: threshold: pH 7.00; hyst: 0.20 above the threshold, the R1 relay is active. R2: threshold: 50.00°C; hyst: 0.10 above the threshold, the R2 relay is active.
Measurement unit for temperature	°C
Language	French

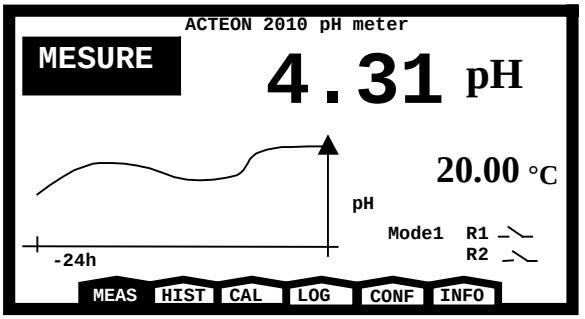
10 The info menu

The INFO window provides information on the type and version of the device. The software and hardware versions must be mentioned when calling technical support or the Ponsel after sales service.



11 ADJUSTING THE CONTRAST OF THE ACTEON 2000 DISPLAY

The contrast of the LCD screen can be adjusted in order to modify the display. This adjustment can only be carried out from the measure window.



Press the ESC and ▽ keys simultaneously to reduce the contrast.
Press the ESC and △ keys simultaneously to increase the contrast.

12 Technical specifications:

Operating temperature
-25 °C to +55 °C

Storage temperature
-25 °C to +65 °C

Power supply
230VAC 50Hz (10VA).
24 VDC (24V optional)

Fuse
Protected by a 250mA fuse

Leak-tightness – IP degree
IP 65

Standard:
CE

13 The sensors

13.1 The pH sensor

13.1.1 Specifications

Length of glass part: 65 mm
Working range: 0-14 pH (insensitive to Na+ ions up to pH 13)
Working temperature: -5 to 50°C
Pressure: Max. 5 bars.
Cable: anti-static coaxial cable, max. length 10m.
Response time: 1 second per metre of cable.
Minimum measurement volume: 0.5ml

13.1.2 Description

The pH sensor is made up of:

- A "glass electrode" made up of a special very fine glass bulb sensitive to pH, soldered to the tip of a crystal tube. The resistance of the electrode is around 1000 MΩ*.
  The glass pH bulb is protected by a polyethylene strainer.
  * Requires at a minimum an input circuit of 10^5 MΩ.
- An Ag/AgCl type plasticized electrolyte saturated KCl "Plastogel®[1]" "reference electrode".
  The Plastogel® electrolyte is in direct contact with the external environment without interposition of capillary or porous material. There is therefore no risk of clogging or de-priming of the reference (the risk of splicing error is low since there is a large contact surface).
- The mechanical resistance of the sensor and leak-tight sealing of the cable are ensured by a shaft made out of a plastic material (Delrin).
- The protective casing maintains the glass electrode in a moist atmosphere (it is totally leak-tight when the casing air-hole is positioned between 2 ring-type joints).

[1] Constant potential electrode to complete the electrical circuit: Potential = +0.188V at 20°C (a chlorided silver wire immersed in the plasticised electrolyte saturated with potassium chloride).

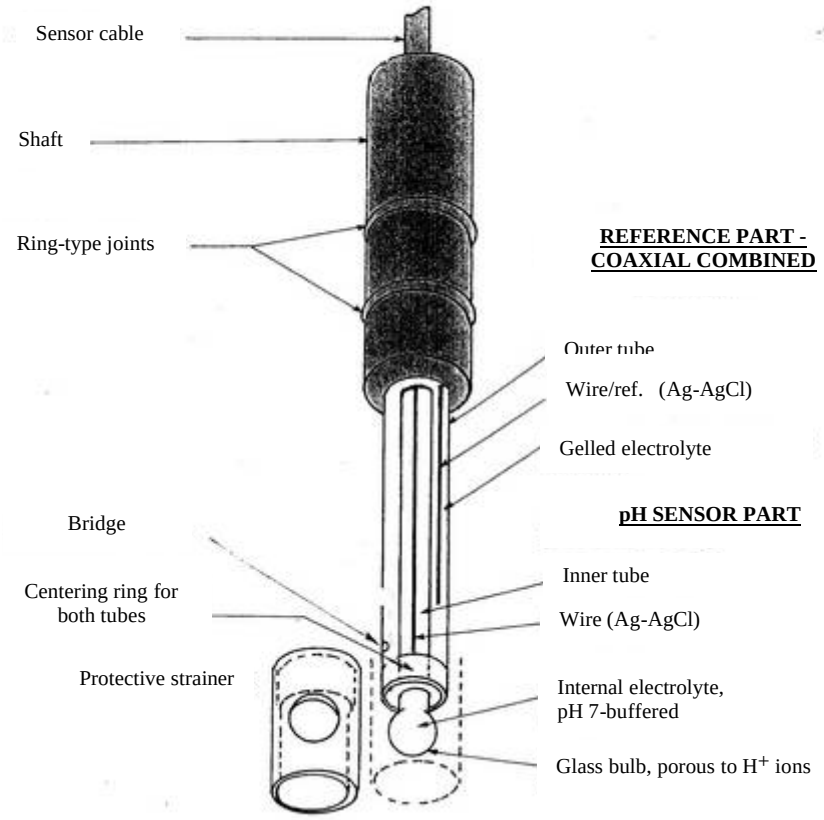


Figure 10- Diagram of the pH sensor

13.1.3 Activation

- Remove the protective casing by pulling and turning the entire assembly[2].
- Connect the electrode to the measuring system.
- Immerse the electrode in the water to be analysed.

Comment:

Between measurements, it is vital to rinse in permuted water (failing this, in Volvic or demineralised water).

- WHEN HOT: Avoid heat shock. If it is necessary to immerse a cold electrode in a medium with a temperature greater than 50°C, immerse it three times in short bursts at intervals of a few seconds.
- WHEN COLD: Ditto for the operating procedure.
  With the plasticized electrolyte, there is no risk of the reference electrode de-priming. The risk of splicing error, which is low at normal temperatures, does not increase at low temperatures any more than at high temperatures.

[2] Normally, the casing should contain several drops of STORAGE SOLUTION or, failing that, a saturated KCl solution.

13.1.4 Maintenance

- After use, rinse the electrode in demineralised water.
- Place the protective casing back on the sensor after having checked that the casing contains several drops of storage solution or, failing that, saturated KCL solution.
- The glass bulb of the electrode is very fragile, therefore extreme care must be taken when cleaning the sensor (especially when the polyethylene strainer is removed).
- Make sure that the connections of the pH sensor remain clean and dry in order to maintain the electric insulation which is vital to the good working order of the sensor.

Do not store the pH sensor in the protective casing filled with (especially very pure) water for long periods of time.
The reserve of Plastogel KCl salt, whilst of considerable size, may deplete and be used up prematurely if the salt is diffused in water with a low ionic strength.
If there is no storage solution, which is ideal for this use, or saturated KCl solution (several drops are sufficient in both cases), it is possible to make do with slightly moistening the inside of the protective casing before storage so as to maintain an atmosphere conducive to hydration of the glass pH bulb.
In such a case, the sensor can be stored for unlimited periods and also be ready for use.
The pH sensor must never be allowed to dry.

13.1.5 Cleaning

- One rinse in demineralised water is sufficient, in general.
- In case of heavy soiling, immerse the sensor for one hour in a pH cleaning solution (pepsin + HCl).
- Take care not to damage the plasticized electrolyte contact zone located immediately behind the glass pH bulb.
- Using Vaseline, grease the ring-type joints on the delrin shaft from time to time. This eases sliding of the casing and improves storage leak-tightness.

13.2 The temperature sensor

Stainless steel sensor with DELRIN shaft.

Working temperature: -20 to 55°C
Pressure: Max. 5 bars.
Cable: stranded.

14 Questions & Answers

14.1 pH measurement anomalies

The response to pH variations is too weak:

The glass electrode is soiled and must be cleaned (rub carefully with filter paper soaked with toluene).

There is no response to pH variations:

The glass electrode bulb is broken or cracked, or the connection between the sensor and ACTEON 2000 is faulty.

The measurement is unstable:

The electrolyte contact with the medium is poor, the connection between the sensor and ACTEON 2000 is faulty or the connector is wet: rinse thoroughly with alcohol.

15 Appendix

Wiring diagram for the ACTEON 2010 terminal :

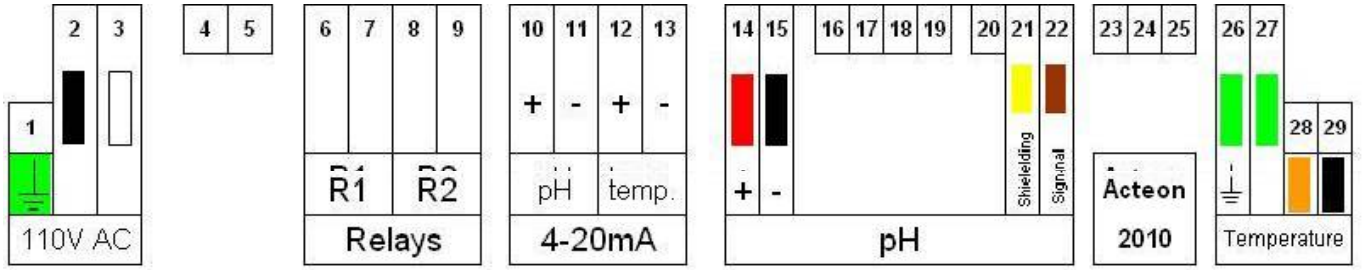


Figure 11- Wiring diagram for the transmitter terminal

If the temperature sensor is not connected, terminal points 28 and 29 must be linked up to the shunt (supplied with the terminal).
If the temperature sensor is connected, the shunt between terminal points 28 and 29 must be removed.

Every time the cover of the ACTEON is shut, it is essential to check that the sealing joint is correctly positioned in its groove (on the cover).

After sales service:

PONSEL MESURE
Service SAV
35 rue Michel MARION
56850 CAUDAN - FRANCE
sav@ponsel.fr
TEL: +33 (0)2 97 89 25 31
FAX: +33 (0)2 97 76 55 72

Serial number: